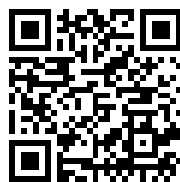


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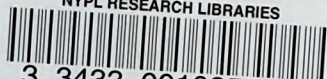
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9

*(To face Cautionary Notice in all Sailing Directions.)*

NOTATIONS OF SUPPLEMENTS AND ANNUAL  
SUMMARIES OF NOTICES TO MARINERS  
RELATING TO THIS BOOK.

To be filled in by Navigating Officer.

[In Chart Dépôts the two first columns are alone to be filled up.]

Title.	Date of Publication and Number.	Whether pasted in or noted in Margins of Book, and Date of each Correction.

KAKK

Great Britain





# NOTICE.

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## HYDROGRAPHIC DEPARTMENT, ADMIRALTY.

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IN January of each year the information affecting this book, which has been published during the preceding year in the Admiralty Notices to Mariners, is compiled and issued as a separate publication. If a supplement has been issued during the year, this publication will only include Notices issued since the date of the Supplement. Mariners are advised to procure copies of these publications. They can be obtained gratuitously from the Admiralty Agent or Sub-Agents for the sale of charts on presentation of the coupons on the next page, either personally or by letter. In the latter case the cost of postage must be enclosed.

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H. E. P.-C.

Revised Supplement II. to

CHINA SEA PILOT, Vol. III.,

1912.

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1912.

Supplement to

CHINA SEA PILOT, Vol. III.,

1912.



# NOTICE.

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CHINA SEA PILOT, Vol. III., 1912.





Great Britain. Hydrographic Office

THE  
CHINA SEA PILOT, VOL. III.

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CONTAINING  
DIRECTIONS FOR THE NAVIGATION  
OF THE MAIN ROUTE AND THE WESTERN  
SHORE OF THE CHINA SEA, BETWEEN  
SINGAPORE STRAIT AND HONG KONG.

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*FIRST EDITION.*

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COMPILED BY CAPTAIN C. H. C. LANGDON, R.N.

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**ALL BEARINGS ARE TRUE.**

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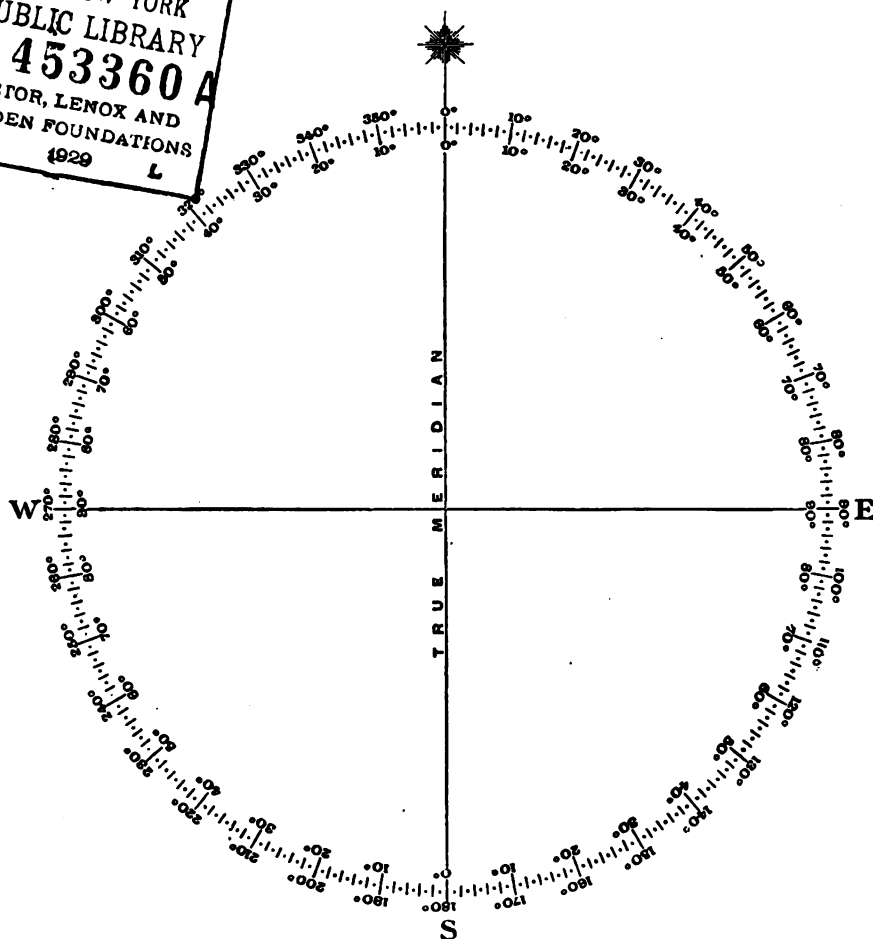
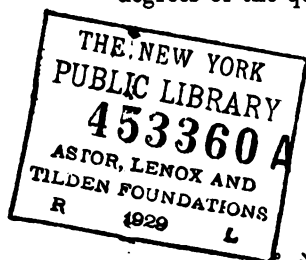
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Diagram to facilitate the conversion of True Bearings expressed in degrees of the circle from  $0^{\circ}$  to  $360^{\circ}$  into True Bearings expressed in degrees of the quadrant from  $0^{\circ}$  to  $90^{\circ}$ , and vice versa.



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MANUSCRIPT

## ADVERTISEMENT TO THE FIRST EDITION.

The China Sea Pilot is in process of being prepared in five volumes. This volume, the third of the series, deals with the western shore of the China sea between Singapore strait and Bias bay, eastward of Hong Kong, including the main route and the dangers bordering it.

It is compiled chiefly from the old China Sea Directory, Vol. II., and the Sailing Directions published by the French Government. A list of other authorities consulted will be found on the following page.

As a considerable area of the China sea has only been partially surveyed, it should be navigated with caution.

This volume has been compiled by Captain C. H. C. Langdon, R.N.,

All bearings are true, and in degrees from 0° (North) to 360°, reckoned clockwise.

Views have been added to the volume to supplement those on the charts, and it is anticipated that they will prove of service to the mariner.

Mariners and others are invited in the interests of navigation to forward to the Hydrographer, Admiralty, London, S.W., any information that may come under their notice, which would be useful for the correction of the charts and other hydrographic publications issued by the British Admiralty; early advice as to newly-discovered dangers, the establishment of, or changes in, any aids to navigation, is specially requested.

Copies of a form (H. 102) on which to render information, can be obtained gratis from the Admiralty chart agent:—

Mr. J. D. POTTER,  
145, Minories, London, E.C.

or of any of his sub-agents in Great Britain and abroad.

By the publication of this work, the China Sea Directory, Vol. II., Revised Supplement, 1909, and all Notices to Mariners relating to that work, up to and including No. 1,273, of 1912, are cancelled.

H. E. P.-C

*Hydrographic Office,  
Admiralty, London,  
14th December, 1912.*

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# GLOSSARY

## OF A FEW USEFUL GEOGRAPHICAL AND OTHER TERMS IN THE MALAY LANGUAGE.

Malay.	English.	Malay.	English.
Alang alang - - -	Reeds	Lant - - -	Sea
Angin - - -	Wind	Layar - - -	Sail
Api - - -	Fire	Lumpur or Lumpur -	Mud
Arang - - -	Coal	Manuk - - -	Bird
Arus - - -	Current	Masin - - -	Salt
Ayer - - -	Water	Mesigit - - -	Mosque
— masin - - -	Salt water	Missigit - - -	Mosque
— pasang - - -	Flood or high tide	Muara - - -	Mouth of a river
— surut - - -	Ebb or low tide	Nagri - - -	Town
— tawar - - -	Fresh water	Nipa - - -	Small marsh palm
Baharu - - -	New	Nusa - - -	Island
Bambu - - -	Bamboo cane	Padi - - -	Rice in the straw
Barat - - -	West	Pandoman - - -	Mariner's compass
Batu - - -	Rock, stone	Panjang - - -	Long
Besar - - -	Large, great	Pantel - - -	Coast, seaboard
Beal - - -	Iron	Pasang besar - - -	High tide
Beting - - -	Shoal, sand	— kring - - -	Low tide
Buluh - - -	Bamboo cane	— naik - - -	Flood tide
Burung - - -	Bird	— surut - - -	Ebb tide
Bukit - - -	Hill	— turun - - -	Ebb tide
Buwah - - -	Fruit	Pasir - - -	Sand
Chettek - - -	Shallow	Pelabuan - - -	Anchorage
Daging-Sapi - - -	Beef	Pingir Laut - - -	Coast, seaboard
Dalem or Dalam -	Deep	Pisang - - -	Banana
Dammar - - -	Gum	Pohun or Puhun -	Tree
Darat - - -	Coast, land	Frau, prahu - - -	Boat, ship
Dessa - - -	District, with villages	Fulo - - -	Island
Ei (Misol) - - -	Island	Puth - - -	White
Gadong - - -	House	Renda - - -	Low
Gunong - - -	Mountain	Rotan - - -	Rattan cane
Gusong - - -	Reef of rocks	Roti - - -	Bread
Ikan - - -	Fish	Ruma - - -	House
Itam - - -	Black	Sampai - - -	Small boat
Jalan - - -	Road	Sawuh - - -	Anchor
Jambatan - - -	Mole, jetty	Sayuran - - -	Vegetables
Jankar - - -	Anchor	Selat - - -	Channel, strait
Kalapa or Kelapa -	Cocoanut	Si - - -	An article inseparably united to nouns and denoting familiarity
Kaler - - -	North	Sungi - - -	River
Kali - - -	River	Tali - - -	Cable
Kampong - - -	Village	Tanah - - -	Land, country
Kapal - - -	Ship	Tanjong - - -	Cape, point
Karang - - -	Coral	Tebu - - -	Sugar-cane
Kayu - - -	Tree	Tedoh - - -	Calm
Kechil - - -	Little, small	Telok or Teluk -	Bay
Kering - - -	Dry	Teplaut - - -	Coast, seaboard
Kidul - - -	South	Tida Angin - - -	Calm
Kotta - - -	Town	Titian - - -	Mole, jetty
Kring - - -	Dry	Tohor - - -	Shallow
Kroon boom - - -	Round-topped tree	Toko - - -	Store
Kupel boom - - -	Dome-topped tree	Trepang - - -	Bêche-de-mer
Kwala - - -	Mouth of a river	Trumbu - - -	Dangerous hidden shoal
Labuan - - -	Anchorage	Trusan - - -	Channel
Lama - - -	Old	Tuwak - - -	Old

### PRINCIPAL POINTS OF THE COMPASS (MALAY).

Malay.	English.	Malay.	English.
Utara - - -	North	Salatan - - -	South
Utara-samata timor -	N.N.E.	Salatan-daya - - -	S.S.W.
Timur-laut - - -	N.E.	Barat-daya - - -	S.W.
Timur-samata utara -	E.N.E.	Barata-samata-salatan -	W.S.W.
Timur - - -	East	Barat-tapat - - -	West
Timur-tenggara - - -	E.S.E.	Barat-samata-atara -	W.N.W.
Tenggara - - -	S.E.	Barat-laut - - -	N.W.
Salatan-tenggara - -	S.S.E.	Utara-barat-laut - -	N.N.W.

## A GLOSSARY

OF SIAMESE WORDS, WHICH SOMETIMES OCCUR IN THE CHARTS  
AND SAILING DIRECTIONS.

Siamese.	English.	Siamese.	English.
Ao, Au . . . .	Bay, creek	Nam-Khum . . .	Rising tide
Ban . . . . .	House	Nam-long . . .	Ebbing tide
Bang . . . . .	Village	Nam-o . . . . .	Beginning of rising tide
Bon . . . . .	Upper	Nam-tem-khray e	High water
Buri . . . . .	City	Naung . . . . .	Lake, swamp
Chaung, Chong . .	Strait	Nawi . . . . .	Small
Dam . . . . .	Black	Nel . . . . .	In
Dan . . . . .	Police or Customs station	Nel-kwa . . . .	Inner
Daung . . . . .	Forest	Nol . . . . .	Little, less
Deng . . . . .	Red	Nol-kwa . . . .	Lesser
Din niau . . . . .	Clay	Nok . . . . .	Out
Din-si-fong . . . .	Chalk	Nok-kwa . . . .	Outer
Dol, Dowl . . . . .	Mountain	Nong . . . . .	Pond, pool
Don . . . . .	Island	Pa . . . . .	Forest
Fai . . . . .	Fire, light	Pak . . . . .	Mouth
Hat, Hatsai . . . .	Sandbank	Pak-nam . . . .	Mouth of a river
Hin . . . . .	Rock, stone	Phra . . . . .	Pagoda
Hoi . . . . .	Stream	Phrair . . . . .	Tributary of a river
Htung . . . . .	Field, plain	Pom . . . . .	Fort
Huê . . . . .	Mountain stream	Pu . . . . .	Hill
Kau . . . . .	Old	Rai . . . . .	Clearing in forest
Kháo . . . . .	Mountain, hill	Rong-pa-si . . .	Custom house
Kháo . . . . .	White	Sai . . . . .	Sand, gravel
Khlon . . . . .	Mud	Sala . . . . .	Rest house
Klong . . . . .	Canal or creek	Sao-thong . . . .	Flagstaff
Koh . . . . .	Island	Sap . . . . .	Great
Kupa . . . . .	Savages	Ta . . . . .	Landing place
Laam . . . . .	Bay, river bend	Tha-le . . . . .	Sea, lake
Lang . . . . .	Lower	Thai . . . . .	Siamese
Langtao . . . . .	Bar	Thang . . . . .	Road
Lat . . . . .	Short cut	Thit nua . . . .	North
Lek . . . . .	Small	Thit tai . . . . .	South
Lem . . . . .	Cape, point	Thit tawan-ok . .	East
Lom . . . . .	Wind	Thit tawan tok . .	West
Luang . . . . .	Yellow	Thi-thort-samor .	Anchorage
Luong . . . . .	Great	Toko . . . . .	Storehouse
Mai . . . . .	New	Tong . . . . .	Mountain
Me . . . . .	River	Tumniep . . . . .	Rest house
Menang . . . . .	Province	Wat . . . . .	Temple
Mouthon . . . . .	Province or State	Yai . . . . .	Great
Muang . . . . .	Town	Yai-kwa . . . . .	Greater
Na . . . . .	Field	Yort . . . . .	Peak
Nam . . . . .	Water, tide		

A SHORT GLOSSARY OF CHINESE WORDS OCCURRING  
IN THE  
CHARTS AND SAILING DIRECTIONS.

<i>Chinese.</i>	<i>English.</i>	<i>Chinese.</i>	<i>English.</i>
Ai - - -	A saddle between hills.	Kau - - -	Mouth of a river.
An - - -	Shore.	Kiang - - -	River.
Cha - - -	Barrier, sand.	Kiau - - -	Bridge.
Cha kwang mu -	Boom.	Kin - - -	Gold.
Chai - - -	Camp.	King - - -	Capital, city.
Chau - - -	District city of the second order, islet.	King chi chau -	Peninsula.
Cheng, Chin -	Town or city.	Kio - - -	Cape, point.
Chia - - -	Cape.	Ko - - -	Rocky peak, head-land.
Chiao - - -	Bridge	Kong - - -	Temple.
Chow chow -	Rippling of water.*	Kwan - - -	Custom-house.
Chuang - - -	Village	Kwang lau -	Lighthouse.
Chuen - - -	Channel.	Ku - - -	Valley.
Chung yuen -	Mainland.	Lan - - -	Market place.
Fang - - -	Hamlet, house.	Lau - - -	Tower, old.
Fau fu - - -	Buoy.	Lang - - -	Waves.
Fau tau - - -	Roadstead.	Leang - - -	Ledges.
Feng - - -	Peak.	Lei hsien chu -	Telegraph.
Fon - - -	Wind.	Li - - -	Inner, one-third of a mile.
Fu - - -	District city of the first order.	Liao - - -	Distant.
Gau - - -	Harbour.	Lin - - -	Forest.
Hada - - -	Mountain.	Ling - - -	Chain of hills, mountain pass.
Hai - - -	Sea, lake.	Lu - - -	Road.
Hai kau - - -	Bight, creek.	Lung - - -	Tiger, dragon.
Hai kio - - -	Cape.	Ma - - -	Horse.
Hai mun - - -	Estuary.	Ma tau - - -	Jetty, port.
Hai tao - - -	Island.	Maima - - -	Trade.
Hai wan - - -	Bay.	Mei - - -	Coal.
Hai yau - - -	Gulf.	Men - - -	Gate.
Hang - - -	Dry.	Miau - - -	Temple.
Hao - - -	Ditch.	Mu - - -	A wood.
He - - -	Black.	Mun - - -	Pass.
Hia - - -	Gorge, lower.	Muren - - -	River.
Hia kau - - -	Strait.	Nan - - -	South, southern.
Hiang tsun -	Village.	Nei - - -	Inner.
Hien, Hsien -	District city of the third order.	Ni - - -	Mud.
Hiu - - -	Cliff, market.	Nui - - -	Inner.
Ho - - -	River.	Omo - - -	Lake.
Ho tun - - -	Lighthouse.	Pa - - -	Embankment.
Hsi - - -	Swamp.	Pai - - -	White.
Hu - - -	Lake, reservoir.	Pan - - -	Hill.
Hung - - -	Red.	Pau tai - - -	Fort.
Hwan - - -	Bay.	Pe, peh, pei -	North.
Hwang - - -	Yellow.	Pho - - -	Market.
I - - -	Barbarian.	Ping - - -	A plain.
Kang - - -	Ridge, village.	Po - - -	Lake.
Kao - - -	High.		

[continued.]

\* Chow chow water is a term applied to rippings or eddies caused by the meeting of adverse currents, the stream passing over uneven rocky bottom, or round the sharp bend of a river, which are frequently so violent as to render a vessel unmanageable when within their influence.



<i>Chinese.</i>	<i>English.</i>	<i>Chinese.</i>	<i>English.</i>
Pu - -	Citadel, commercial village.	Ta - -	Pagoda, great.
Pwang she - -	Rocks.	Tai - -	Plateau.
Sampan - -	Boat.	Tan - -	Rapid, shoal or bar.
San - -	Hill, mountain.	Tang - -	Lake.
Seau - -	Little.	Tao, tau - -	Island.
Sei - -	Temple.	Tau tu - -	Clay.
Sha - -	Sand, sandbank.	Than - -	Rapids.
Sha sien - -	Shoal.	Ting, Ti tau - -	Promontory.
Sha tan - -	Bar.	To - -	Bay.
Shan - -	Hill, mountain.	To mu - -	Wooded.
Shan hu - -	Coral.	Tsi - -	Ravine.
Shan tau - -	Bluff, cliff.	Tsiau pi - -	Cliff.
Shan ting - -	Mountain chain.	Tsui - -	Cape.
Shang - -	Upper.	Tsui sha - -	Gravel.
Shao - -	Small.	Tsui wei - -	Rocky, stony.
She - -	Stone.	Tung - -	East, eastern.
She tan - -	Reef.	Tutan - -	Ferry.
Shi - -	Market.	Ula - -	River.
Shin - -	Spirit (Celestial).	Wai - -	Outer.
Shui - -	Water, small river.	Wan - -	Bay.
Si - -	West, western.	Wi mo ti - -	Isthmus.
Sia - -	Lower.	Wei - -	Outer, military post
Siau - -	Small.	Yang - -	Blue, sheep.
Siau ho - -	Rivulet.	Yao - -	Small.
Sin - -	New.	Yen tun - -	Beacon, buoy.
Sing - -	A spring.		
So - -	Town, village.		

# MONEY, WEIGHTS, AND MEASURES.

## FEDERATED MALAY STATES.

Weights and measures as well as currency are the same as in the Straits Settlements.

The dollar, value 2s. 4d., is the standard coin, and with the half dollar and the British sovereign is legal tender for the payment of any amount. Subsidiary silver coins are 20, 10, and 5 cent pieces; copper coins are cents, half cents, and quarter cents.

The measure of length in use is the English yard with its divisions and multiples, and land is measured by the English acre. The native terms are, however, still in use.

Commercial weights are :—

- 1 Kati = 16 Tahlil =  $1\frac{1}{2}$  lbs. avoirdupois.
- 1 Pikul = 100 Kati =  $133\frac{1}{2}$  lbs. avoirdupois.
- 1 Koyan = 40 Pikul =  $5,333\frac{1}{2}$  lbs. avoirdupois.

The Kati of  $1\frac{1}{2}$  lbs. is known as the Chinese Kati (Catty). The measures of capacity are the gantung or gallon, and chupak or quart.

## SIAM.

The unit of the monetary system is the silver tical, weighing 15 grams, .900 fine. Its value (formerly varying with the price of silver) has, by the Gold Standard Act of 1908, been fixed at 1s. 6 $\frac{1}{2}$ d., or 13 ticals = £1, the gold value of the tical being equal to that of 55.8 centigrams of pure gold. There will be a 10-tical gold piece, or *Dos*, weighing 6.2 grams, .900 fine, and thus containing 5.58 grams of pure gold. In addition to the tical the following coins are now actually in use :—

The *Salung* =  $\frac{1}{4}$  Tical, the 10-Satang piece =  $\frac{1}{100}$  of a Tical.

The 5-Satang piece =  $\frac{1}{100}$  of a Tical, and the Satang =  $\frac{1}{100}$  of a Tical.

The *Salung* is of silver, .800 fine. The 10-Satang and 5-Satang pieces are of nickel, whilst the Satang is of bronze.

The measures of weight are :—

- 1 *Tical* = 15 grams or approximately .53oz.; 4 *Ticals* = 1 *Tamlung* (60 grams or 2.1oz.); 20 *Tamlungs* = 1 *Chang* (1.2 kilograms or 2lbs. 10.3oz.); and 50 *Chang* = 1 *Hap* (60 kilograms or slightly over 132 $\frac{1}{2}$ lbs.).

The measures of length are :—

- 1 *Niu* = .83 inches; 12 *Niu* = 1 *Keup* (10 inches); 2 *Keup* = 1 *Sok* (20 inches); 4 *Sok* = 1 *Wa* (80 inches); 20 *Wa* = 1 *Sen* (133 feet); 400 *Sen* = 1 *Yot* (10 miles, roughly).

## FRENCH INDO-CHINA.

For French Indo-China there is a coinage of silver pieces, piastres,  $\frac{1}{2}$  piastres,  $\frac{1}{4}$  piastres, and  $\frac{1}{10}$  piastres; the piastre (since 1895) weighs 27 grams and the fractional coins in proportion; the piastre and  $\frac{1}{2}$  piastre are .500 fine, but the  $\frac{1}{4}$  and  $\frac{1}{10}$  piastre (since 1898) only .835 fine. The piastre and the Mexican dollar are usually worth rather less than 24d. There are two bronze coins, one equal to the 100th and the other the 375th part of a piastre.

## CHINA.

The sole official coinage and the monetary unit of China has been hitherto the copper cash; of which about 1,220 = 1 haikwan tael, and about 35 = 1 penny. A coin recently issued in great numbers by the provincial mints is the "hundredth of a dollar." This coin, of which the issue to the end of 1906 is computed to have been 12,500,000,000, has been readily accepted, but latterly at rates corresponding closely to the intrinsic value of the metal in it. The face value of the coin is about  $\frac{9}{10}$ d., the intrinsic worth about  $\frac{1}{100}$ d.

The use of silver bullion, or sycee, as the medium of exchange, is not now much less common, but the circulation of the dollar is certainly extending. The haikwan (or customs) tael was equal in value in 1909 to 31½d.

The dollar (of the same weight and touch as the Mexican dollar) is now current in all the provinces, even in out-of-the-way districts. Notes for cash are also much in vogue.

A decree (agreed to by Great Britain) was issued May 25th, 1910, establishing the silver dollar (yuan) of .90 touch and weighing .72 Treasury-weight tael as the unit of currency. The touch and weight of the silver subsidiary coins (50 c., 25 c., and 10 c.) was also definitely specified, while provision was made for further subsidiary coins (5 c. nickel, 2 c., 1 c.,  $\frac{1}{2}$  c., and  $\frac{1}{10}$  c. copper), of touch and weight to be laid down later. The minting of these coins has begun, but none are yet (1911) in circulation. The several mints are now under the Central Government. The K'up'ing tael weighs 575.642039 grains, somewhat less than the Haikwan tael, which weighs 581.47 grains.

A decree for uniform weights and measures was issued October 9th, 1907, whereby the K'up'ing or Treasury tael was made the standard weight.

Weight.	Capacity.	Length.
10 SSū = 1 Hu.	10 Ko = 1 Sheng.	10 Fen = 1 Ts'un (inch).
10 Hu = 1 Hao.	10 Sheng = 1 Tou	10 Ts'un = 1 Ch'ih (foot)
10 Hao = 1 Li (nominal cash).	(holding from 6½ to 10 Kin of rice and measuring from 1.13 to 1.63 gal- lon). Commodities, even liquids, such as oil, spirits, are commonly bought and sold by weight.	= 14.1 English inches, by Treaty.
10 Li = 1 Fên (Candaren).		10 Ch'ih = 1 Chang (2 fathoms)
10 Fên = 1 Ch'ien (Mace).		1 Li = approximately 3 cables.
10 Ch'ien = 1 Liang (tael) = $\frac{1}{3}$ oz. avoirdupois, by Treaty.		
16 Liang = 1 Chin (Catty) = 1½lbs.		
100 Chin = 1 Tan (Picul) = 133½lbs.		

In the tariff settled by treaty between Great Britain and China, the *Ch'ih* of 14 $\frac{1}{10}$  English inches, has been adopted as the legal standard. The standards of weight and length vary all over the Empire, the *Ch'ih*, for example, ranging from 9 to 16 English inches, and the *Chang* (= 10 *Ch'ih*) in proportion; but at the Treaty ports the use of the foreign treaty standard of *Ch'ih* and *Chang* is becoming common.

# SYSTEM OF ORTHOGRAPHY

*Adopted by the Admiralty for Sailing Directions and Charts.*

As far as has been found possible with existing knowledge, native names are spelt in accordance with the following system, which has been adopted by the principal authorities in Great Britain, and by the United States, and has been for some years in process of gradual introduction into all Admiralty Sailing Directions and Charts.

No change is made in the orthography of foreign names in countries which use Roman Letters ; thus French, Spanish, Portuguese, Dutch, &c., names will be spelt as by the respective nations.

1. Where native names have been so long written in a form which, though not in accordance with this system, has become familiar to English eyes from being so spelt in all charts and maps, they are retained.

2. The true sound of the word as locally pronounced is taken as the basis of the spelling.

3. An approximation of the sound is alone aimed at. A system which would attempt to represent the more delicate inflections of sound and accent would be so complicated as only to defeat itself.

4. The broad features of the system adopted are that vowels are pronounced as in Italian and consonants as in English, *every letter being pronounced*. Two accents only are used :—

(1.) The acute, to denote the syllable on which stress is laid. The use of this is very important, as the sounds of many names are entirely altered by the misplacement of this “stress.”

(2.) The sign ~ over the letter U to denote the short sound of that vowel under certain circumstances. (See table.)

5. When two vowels come together, each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai, au, ei*.

The amplification of the rules is given on the following pages.

Information is invited as to the proper spelling of native names, so as to produce the nearest approximation to the true sound, by this system.

Letters.	Pronunciation and Remarks.	Examples.
a	<i>ah</i> , <i>a</i> as in <i>father</i> - - - - -	Java, Banána, Somáli, Bari.
e	<i>eh</i> , <i>e</i> as in <i>bet</i> ; <i>a</i> as in <i>fate</i> - - -	Tel-el-Kebír, Oléleh, Yezo, Levúka, Peru.
i	English <i>e</i> ; <i>i</i> as in <i>ravine</i> ; the sound of <i>ee</i> in <i>beet</i> . Thus, not <i>Feejee</i> , but	Fiji, Hindi.
o	<i>o</i> as in <i>mote</i> - - - - -	Tokyo.
u	long <i>u</i> as in <i>flute</i> ; the sound of <i>oo</i> in <i>boot</i> . <i>oo</i> or <i>ou</i> should never be employed for this sound. Thus, not <i>Zooloo</i> or <i>Zoulou</i> , but	Zulu, Šumatra.

Letters.	Pronunciation and Remarks.	Examples.
	<p>The shorter sound of the different vowels, when necessary to be indicated, can be expressed by doubling the consonant that follows. The sounds referred to are as follows :—</p> <p>The short <i>a</i> as in <i>father</i>, as compared with the long <i>a</i> as in <i>father</i>.</p> <p>The short <i>e</i> as in <i>better</i>, as compared with the long <i>e</i> as in <i>fate</i>.</p> <p>The short <i>i</i> as in <i>sinner</i>, as compared with the long <i>i</i> as in <i>ravine</i>.</p> <p>The short <i>o</i> as in <i>sobbing</i>, as compared with the long <i>o</i> as in <i>sober</i>.</p> <p>The short <i>u</i> as in <i>rubber</i>, as compared with the long <i>u</i> as in <i>rubric</i>.</p>	Yarra, Tanna, Mecca, Jidda, Bonny.*
ü	<p>is the same short sound of <i>u</i> as is denoted by doubling the consonant following, but is used, and only used, where such doubling is impossible, as in case of words where <i>u</i> is followed by two different consonants, as in <i>Tüng</i>, pronounced as the English <i>tongue</i>.</p> <p>Doubling of a vowel is only necessary where there is a distinct repetition of the single sound.</p>	Nuulúa, Oosima.
ai	English <i>i</i> as in <i>ice</i> - - - -	Shanghai.
au	<i>ow</i> as in <i>how</i> - - thus, not <i>Foochow</i> , but	Fuchau.
ao	is slightly different from <i>au</i> - - - -	Macao.
aw	when followed by a consonant or at the end of a word as in <i>law</i> - - - - thus	Cawnpore.
ei	is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from <i>ey</i> in the English <i>they</i> , or <i>ei</i> in <i>eight</i> .	Beirút, Beilul.
b	English <i>b</i> .	
c	<p>is always soft, but is so nearly the sound of <i>s</i> that it should be seldom used.</p> <p>If <i>Celébes</i> were not already recognised it would be written <i>Selébes</i>.</p>	Celébes.
ch	is always soft as in <i>church</i> - - - -	Chingchin.
d	English <i>d</i> .	
f	English <i>f</i> . <i>Ph</i> should not be used for the sound of <i>f</i> . Thus, not <i>Haiphong</i> , but	Haifong, Nafa.
g	is always hard. (Soft <i>g</i> is given by <i>j</i> ) -	Galápagos.
h	is always pronounced when used.	
hw	as in <i>what</i> , better rendered by <i>hw</i> than <i>wh</i> , or <i>h</i> followed by a vowel. Thus, <i>Hwang ho</i> , not <i>Whang ho</i> or <i>Hoang ho</i> .	Hwang ho, Ngan hwei.
j	English <i>j</i> . <i>Dj</i> should never be put for this sound.	Japan, Jinchuen.

\* The *y* is retained as a terminal in this word under Rule 1. The word is given as a familiar example of the alteration in sound caused by the second consonant.



Letters.	Pronunciation and Remarks.	Examples.
k	English <i>k</i> . It should always be put for the hard <i>c</i> . Thus, not <i>Corea</i> , but	Korea.
kh	The Oriental guttural - - - - -	Khan.
gh	is another guttural, as in the Turkish -	Dagh, Ghazi.
l	} As in English.	
m		
n		
ng		
	has two separate sounds, the one hard as in the English word <i>finger</i> , the other as in <i>singer</i> . As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them.	
p	As in English.	
ph	As in <i>loophole</i> - - - - -	Mokpho, Chemulpho.
th	stands both for its sound in <i>thing</i> , and as in <i>this</i> . The former is most common -	Bethlehem.
q	should never be employed ; the sound of <i>qu</i> in <i>quiver</i> is given as <i>kw</i> . When <i>qu</i> has the sound of <i>k</i> , as in <i>quoit</i> , it should be given by <i>k</i> .	Kwangtung.
r	As in English.	
s	As in <i>sin</i> .	
sh	} As in English.	
t		
v		
w		
x		Sawákin.
y	is always a consonant, as in <i>yard</i> , and therefore should never be used as a terminal, <i>i</i> or <i>e</i> being substituted. Thus, not <i>Mikindány</i> or <i>Wady</i> , but not <i>Kwaly</i> , but	Kikūyu.
z	English <i>z</i> - - - - -	Mikindáni, Wadi. Kwale.
zh	French <i>j</i> , or as <i>s</i> in <i>treasure</i> - - - - - Accents should not generally be used, but where there is a very decided emphatic syllable or stress which affects the sound of the word, it should be marked by an <i>acute</i> accent.	Zulu. Muzhdaha. Tongatábu, Galápagos, Paláwan, Saráwak.

In the case of native names in countries under the dominion of other European powers, in whose maps, charts, &c., the spelling is given according to the system adopted by that power, such orthography is, as a rule, disregarded, and the names are spelt according to the British system. Thus the island east of Java in possession of the Dutch is spelt *Madoera* by them, but on Admiralty charts *Madura*. A town in Java appears on Dutch charts as *Tjilatjap* ; in the British, *Chilachap*.

When a foreign language is written in a vocabulary of fixed sounds, so as to permit of transliteration into the British system, a table of equivalents for each letter is drawn up, and names of places can be transliterated without regard to pronunciation.

For Chinese names, the Wade system of spelling, as modified in Playfair's "Cities and Towns of China," is adopted as a basis, being transliterated into this system in the following manner :—

For CH', K', T', TS', TZ', write CH, K, T, TS, and TZ.	For HUO write HWAW.
For Chieh write Chie.	„ J write ZH.
„ Ê, if pronounced short as in CHÊN, FÊN, &c., write Ũ, or U followed by a double consonant.	„ KUA write KWA.
For Ê terminal, as in CHÊ, LÊ, &c., write AW.	„ K'UA write KWA.
For Eh write E.	„ KUEI write KWEI.
„ ÊI write EI.	„ K'UEI write KWEI.
„ ÊRH write URR.	„ KUO write KWAW.
„ HUA write HWA.	„ O write AW.
„ HUI write HWEI.	„ OU write O.
	„ P' write PH.
	„ SSŨ write SE.
	„ Ü write U.
	„ Ũ write E.

In this system the Manchurian dialect is adopted as the basis ; but with regard to names in the provinces of FUH KIEN, KUANG TUNG and KUANGSI, the local pronunciation should be followed as a guide for the spelling. CHIH and SHIH, pronounced somewhat as the shi in shirt, have been retained, as the sounds are difficult to express according to the Royal Geographical Society's rules. Canton and Peiho are to be spelt in this, the customary way.

# INFORMATION RELATING TO CHARTS, SAILING DIRECTIONS, AND THE GENERAL NAVIGATION OF H.M. SHIPS.

## ON THE CORRECTION OF CHARTS, SAILING DIRECTIONS, AND LIGHT LISTS.

THE three descriptions of publications as guides to navigation, which are affected by the continual changes and alterations that take place, are the Charts, the Sailing Directions, and the Light Lists.

Of these the Charts should always be, so far as our knowledge permits, absolutely correct to date; the Sailing Directions, however, cannot, from their nature, be so corrected, and *in all cases where they differ from charts, the largest scale chart must be taken as the guide for navigation.*

The Light Lists are corrected annually.

1. *Charts*.—When issued to a ship on commissioning, the charts have received all necessary corrections to date. As sent from the Hydrographic Department they are correct to the date of issue as stamped on each folio. They then receive such corrections by hand in the dépôts as are required, and are so issued to the ships.

The charts in the folios should have the same number and title as shown against each in the Lists pasted on the outside of the folio. The Navigating Officer is to satisfy himself that they do so agree before signing the receipt for the charts, &c.

All small but important corrections affecting navigation that can be made by hand are notified by Notices to Mariners, and should at once be placed on the charts to which they refer, in accordance with the following uniform system:—

1. All corrections, additions to, or erasures on charts are to be neatly made in *red* (except as explained later in paragraph 6). In every case the recognised chart abbreviations are to be used.

2. The number and date of every Notice to Mariners, from which corrections, &c., as above have been made, are to be entered at the lower left-hand corner of the chart, in *red*, in the following manner, viz.:—  
07 . 123, 1145, 1503; 08 . 232; 10 . 1506, 1721; 11 . 34, &c.

3. The *amount* of the substance of a Notice to Mariners inserted on the chart should as a general rule be limited to what is likely to be engraved on the chart plate when corrected in office, and it should also be inserted as far as possible in a similar style; thus:—

(a) the amount of information to be inserted depends on the scale of the chart, and should be in accordance with that already engraved on the chart. On the largest scales will generally be found all the principal details of lights and their sectors, buoys, &c. On the smallest scales buoys are seldom inserted, and lights are only briefly described as Lt. F., Lt. Gp. Fl., Red, &c., without any details, as to height, visibility, periods, &c.;

(b) when inserting corrections, care must be taken not to obliterate any of the other information already on the chart;

(c) wrecks are shown thus,      "Wreck," and on large scales the "year" is added;

(d) when "Notes" are to be inserted (such as Cautionary, Tidal, &c.) they should be written in a convenient but conspicuous place, where they will not interfere with any other details.

4. The numbers and dates of Notices should *not* be entered on the Charts, except as required by paragraph 2, as they only tend to the increase of illegibility.

5. Erasures, when necessary, should consist of a single line made with a pen. A knife or ink eraser should not be used.

6. Temporary or intended changes should be inserted on the chart in pencil, and in the latter case finally inked in, in red, when further notice has been received confirming the previous one.

7. One copy of each Notice to Mariners should be pasted into the Sailing Directions in its appropriate place, so that, if fuller detail is required than what the scale of the chart permits to be given, it may be found on the proper page referring to the given locality or subject.

When these corrections are so large that they cannot be conveniently thus made they are put upon the plates, and fresh copies are issued to the ships to replace the others, which are directed to be destroyed to prevent the possibility of their being used in the navigation of the ship.

The dates on which these large corrections are made are noted on the chart plates under the heading of "New Editions" in the middle of the lower edge; those of the smaller corrections at the left-hand lower corners as "Small Corrections."

In all cases of quotations of charts, these dates of corrections should be given, as well as the number of the chart (which will be found in the lower right-hand corner), in order that at the Admiralty it may be known what edition of the chart is referred to, and to what date the chart has been corrected.

It should be remembered that in addition to the large and small corrections here mentioned, the chart plates are being constantly corrected for numerous details not considered to be of such a nature as to affect safe navigation. For these corrections the charts are not necessarily dated, nor are any Notices to Mariners issued, and it follows therefore that two charts, both bearing the same dates of "New Editions" and "Small Corrections," may not exactly agree in all respects.

2. *The Sailing Directions* are not corrected before issue, but on page iii. in the "Advertisement" to each volume will be found the number of the last Notice to Mariners used in its revision, the numbers of the subsequent Notices affecting it between going to press and issue to H.M. Ships are given in the Notice to Mariners announcing its publication.

Supplements and Revised Supplements referring to each volume are published from time to time. Supplements contain all the information received up to date since the publication of the volume to which they refer, and a Revised Supplement cancels the previous Supplements.

The existence of a Supplement is to be noted in the tabular form placed for the purpose inside the cover of each volume, and also on receipt of a further Revised Supplement after commission. Two copies are issued to each ship, one of which is to be retained intact, for reference, notations referring to it being made on the pages of the Sailing Directions affected; the other copy may be cut up, if considered desirable, the slips being pasted in the volume at the appropriate place.

In the advertisement to each Supplement will be found the number of the last Notice to Mariners used in its compilation.

In January of each year, a summary of the information affecting each volume of Sailing Directions, which has been published during the preceding year in Notices to Mariners, is issued in a separate publication. If a Supplement or Revised Supplement has been issued during the year, this summary will only include Notices to Mariners issued since the date of such Supplement; if one is in preparation at the end of the year, no summary will be issued.

An early duty of the Navigating Officer after drawing a chart set is to correct the Sailing Directions from the Supplements or Revised Supplements, Annual Summaries of Notices to Mariners and Notices to Mariners supplied with the chart set.

As Notices to Mariners prior to the date of issue of a chart set from the Hydrographic Department are not supplied with the set, he should demand from that Department such Notices to Mariners as are required to complete the interval between the last published Supplement, Revised Supplement, or Summary of Notices to Mariners, and the first number of the Notices to Mariners drawn with the chart set.

One copy of each Notice to Mariners should be pasted into the Sailing Directions in its appropriate place as soon as received.

It must, however, be thoroughly understood that Sailing Directions will never be correct in all minor details, except up to the date of the last Supplement or Revised Supplement, and that, as already stated, when differences exist, the chart, which should be corrected from the most recent information, should be taken as the guide; for which purpose, for ordinary navigation, they are sufficient.

3. *The Light Lists*, annually published at the beginning of each year, are not corrected in the depôts before issue, but appendices are issued every week with the weekly copies of Notices to Mariners, giving the alterations that have taken place.

It is the duty of the navigating officer when he receives the set of charts to make notations in the Light Lists from these appendices, and from Notices to Mariners of later date; and to keep them so corrected from time to time.

The Light Lists should always be consulted as to the details of a light, as the description in the Sailing Directions does not embrace the sectors, and the other information on the lights may be obsolete, in consequences of changes made since publication. A red label to this effect is inserted opposite page 1 of all Sailing Directions. The charts also may not be equally up-to-date in some details, for which no Notices to Mariners have been issued.

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## THE USE OF CHARTS AS NAVIGATIONAL AIDS AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

1. *Reliance on a Chart.*—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger is the scale of the chart.

To estimate this, the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that



precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of Coast sheets, which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the only method of ascertaining the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends it only ascertains the depth of water over an area equal to the diameter of the lead, that is about two inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a width of two inches.

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instances, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor, are made on a scale of three inches to the mile, and surveys of frequented ports, or harbours likely to be used by Fleets, on a scale of from six inches to ten inches to the nautical mile.

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large scale Coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, *i.e.*, of 100 feet square.

The following diagram represents as many soundings as can be placed legibly on a square inch of paper:—

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	16	16	12	11	8½	9	10
18	17	15	12	9	7½	7½	7½	9	10
19	18	12	9	5½	4½	5½	6½	6½	9
22	19	16	10	5½	5½	6½	7½	8½	10
20	16	12	7½	5½	6½	6½	7½	8½	10
16	16	11	9	7½	7	7½	8½	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear weather, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may occasionally escape detection.

Lines of soundings plotted as close as may be practicable on a scale of 6 inches to the mile would be 100 feet apart, and each line would be only 2 inches in actual width.

Thus, in a chart on a scale of 1 inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape the lead; whilst in a chart on a scale of 6 inches, inequalities as large as battle-ships, if lying parallel to, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General Coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the contour line of 10 fathoms, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile, vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead will not rest on them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch.

A wide berth should therefore be given to every rocky shore or patch, **and this rule should be invariably followed, viz., that instead of considering a coast to be clear, unless it is shown to be foul, the contrary should be assumed.**

**2. Fathom Lines a Caution.**—Except in plans of harbours that have been surveyed in detail, the five-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of heavy draught.

Charts where no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed round, as there is no knowing how closely the spot may have been examined.

3. *Chart on largest scale always to be used.*—It sometimes happens that, from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or soundings. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

4. *Caution in using Small Scale Charts.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile. This is particularly to be observed when coming to an anchor on a narrow ledge of convenient depth at some distance from the shore.

For the same reason bearings to objects near should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

5. *Graduation.*—All Plans are now being graduated in skeleton style before publication in order to facilitate easy reference to Astronomical positions; previously published plans are also graduated as opportunity offers. The graduation is, however, of necessity, often based upon imperfect information of a conflicting nature; for this reason, whenever an Astronomical position is quoted other than approximate (*i.e.*, when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived.

6. *Distortion of Printed Charts.*—The paper on which charts are printed has to be damped. On drying, distortion takes place from the inequalities in the paper, which greatly varies with different paper and the amount of the original damping; but it does not affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree, when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion.

7. *Buoys.*—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should therefore be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings or angles of fixed objects on shore and not by buoys.

*Gas Buoys.*—The lights shown by gas buoys cannot be implicitly relied on, as, if occulting or flashing, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British islands are from 5 to 217 candle power.

8. *Lights.*—Circles drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Light Lists and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to height, at the end of

each Light List affords a means of ascertaining how much more or less the light is visible should the height of the bridge be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the standard compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its order, or candle power, as given in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range due to the height at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles, if of any power. (*See table in Light List before mentioned.*)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip, it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

**9. Fog Signals.**—Sound is conveyed in a very capricious way through the atmosphere. Apart from wind, large areas of silence have been found in different directions and at different distances from the fog signal station, in some instances even when in close proximity to it. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly towards the land, and is not observed by the people at a station until it is upon them; whereas a ship may have been for many hours in it, and approaching the land. In such a case no signal may be made. When sound has to travel against the wind, it may be thrown upwards; in such a case, a man aloft might hear it when it is inaudible on deck. Under certain conditions of the atmosphere, when a fog signal is a combination of high and low notes, one of the notes may be inaudible.

The mariner should not assume—

- a. That, because he fails to hear the sound, he is out of hearing distance.
- b. That, because he hears a fog signal faintly, he is at a great distance from it.
- c. That, because he hears the sound plainly, he is near it.
- d. That, because he does not hear it, even when in close proximity, the fog signal has ceased sounding.
- e. That the distance from and the intensity of the sound on any one occasion, are a guide to him for any future occasion.

Taken together, these facts should induce the utmost caution in closing the land in fogs. The lead is generally the only safe guide.

**10. Tides and Tidal Streams.**—In navigating coasts where the tidal range is considerable, caution is always necessary. It should be remembered that there are indraughts to all bays and bights, although the general run of the stream may be parallel to the shore.

The turn of the tidal stream off-shore is seldom coincident with the time of high and low water on the shore. In open channels, the tidal stream ordinarily overruns the turn of the vertical movement of the tide by about three hours, forming what is usually known as tide and half-tide, the effect of which is that at high and low water by the shore the stream is running at its greatest velocity.

In crossing a bar or shallow flats, "Table B, for finding the height of tide at any intermediate hour between high and low water," and diagrams, given in the Tide Tables, will be found of great assistance in calculating how much the water has risen or fallen at any hour of the tide.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can never be depended upon, and additional caution is necessary.

It should also be remembered that at times the tide falls below the level of low-water ordinary springs. This always occurs on the coasts of Europe at the equinoxes, but in other parts of the world and especially in the tropics, such periodic low tides may coincide more frequently with the solstices. Wind or a high barometer may produce it at any time, and the amount varies with locality. When the moon's perigee coincides with the full or new moon the same effect is often produced.

**11. Arrows** on charts only show the most usual or the mean direction of a tidal stream or current. It must never be assumed that the direction of a stream will not vary from that indicated by the arrow. In the same manner, the rate of a stream constantly varies with circumstances, and the rate given on the chart is merely the mean of those found during the survey, possibly from very few observations.

**12. Fixing position.**—The most accurate method of fixing a position relative to the shore is by angles between well-defined objects on the chart. All ships are supplied with a station-pointer, and this method should be used whenever possible.

Two things are, however, necessary to its successful employment: First, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant and station-pointer.

For the former, reference can be made to the pamphlet on the use of the station-pointer, which is in every chart box; the latter is only to be obtained by practice.

It will readily be seen that in war time, when the compass may be knocked away, or gun-fire may make it undesirable to expose the person more than necessary, a sextant offers great advantages, as angles can be obtained from any position whence the objects are visible. It is this contingency that makes it especially desirable that all navigating officers should become expert in this method of fixing a ship's position.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in

either taking or plotting a bearing under such circumstances may put the ship ashore.

It is not intended that the use of the compass to fix the ship should be given up; there are many circumstances in which it may be usefully employed, but errors more readily creep into a position so fixed. In all cases where great accuracy of position is desired, angles should invariably be used, such as the fixing of a rock or shoal, or of additions to a chart of fresh soundings or new buildings. In all such cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself. In the case of ordinary soundings, it is only necessary to take a third angle now and then; firstly, to check the general accuracy of the chart, as above stated; secondly, to make certain that the more important soundings, as at the end of a line, are correctly placed.

Sometimes, when only two objects are visible, a compass bearing and sextant angle may be used with advantage.

In passing near a point of land, or an island, the method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "four-point bearing," when the bearing is taken four points on the bow and on the beam, the distance from the object at the latter position being the distance run between the times of taking the two bearings, allowing for current, gives an excellent fix for a departure but does not ensure safety, as the point and probably the rocks off it are abeam before the position is obtained.

By taking the bearings of two points and four points on the bow, a very good position is obtained before the object is passed; the distance of the latter at the second position being, as before, equal to the distance run in the interval, allowing for current.

This is, however, only strictly true if the current is directly with or against the course of the ship. If a cross current has to be allowed for, the results by this method may be altogether erroneous and misleading. The following example shows in a tabular form the errors that might be produced by accepting the distance run in the interval, allowing for current, as the distance of the object at time of second bearing.

Example: A vessel steering East sights a light bearing E.N.E., or two points on the bow; one hour after, having run in the interval 10 miles by log, the light bears N.E., *i.e.*, she has doubled the angle on the bow. Current, in all cases, at the rate of 2 miles an hour.

Direction of Current	Distance run between 1st & 2nd Bearings		Distance of Light at 2nd Bearing	Direction of Current	Distance run between 1st & 2nd Bearings		Distance of Light at 2nd Bearing
	By Log	Allowing for Current			By Log	Allowing for Current	
	Miles	Miles	Miles		Miles	Miles	Miles
East . .	10	12	12	West . .	10	8	8
E.N.E. .	10	11.8	10	W.S.W. .	10	8.2	10.2
N.E. . .	10	11.4	8	S.W. . .	10	8.7	11.9
N.N.E. .	10	11	6.2	S.S.W. .	10	9.4	13.6
North . .	10	10.2	5.3	South . .	10	10.2	14.7
N.N.W. .	10	9.4	4.9	S.S.E. .	10	11	15
N.W. . .	10	8.7	5.3	S.E. . .	10	11.4	14.7
W.N.W. .	10	8.2	6.1	E.S.E. .	10	11.8	13.8

The following rule should be observed in all cases of a cross current, viz. :—

When the angle between the second bearing and the course made good (over the ground) is double the angle between the first bearing and the course made good (over the ground) the distance from the object is equal to the distance made good (over the ground) between the times of the first and second bearings.

To get a reliable result the difference between the first bearing and the course made good (over the ground) should never be less than  $20^{\circ}$ . It follows, therefore, that it is necessary, before observing the first bearing, to decide upon the course being made good (over the ground). This may be done as follows, viz. :—

From any point, A, on the chart draw a line A B, representing by its direction the course steered and by its length the speed through the water. From the point B, draw another line, B C, representing in a similar manner the estimated direction and rate of the current, &c., to be allowed for. Then a line joining the points A and C will represent in the same manner the course and speed which are being made good (over the ground).

A table of factors, by which to multiply the distance run, to obtain the distance of the object when any number of degrees between the two bearings has been observed, is supplied with all chart sets.

The use of a danger angle in passing outlying rocks with land behind should also not be forgotten. In employing this method, however, caution is necessary, as should the chart be not accurate, i.e., should the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

In fixing by the compass, it must always be remembered that two bearings only are liable to error. An absolute error may be made in either bearing observed; errors may be made in applying the deviation; or errors may creep in in laying them on to the chart. For these reasons, a third or check bearing of some other object should be taken, especially when near the shore or dangers. The coincidence of these three lines will prevent any mistakes.

Amongst astronomical methods of fixing a ship's position, attention is drawn to the great utility of Sumner's method. A Sumner line, that is, a line drawn through the position (obtained by an assumed latitude or longitude) at right angles to the bearing of the sun, as obtained from the azimuth tables, gives at times invaluable information, as the ship must be somewhere on that line, provided the chronometer is correct. A deep cast of the lead at the same time may often serve to give an approximate position on the line. An early and very accurate position can also be obtained by Sumner's method, by getting a Sumner line by a bright star at daylight when the horizon is well visible, and another Sumner line by the sun when a few degrees above the horizon, or, better still, by observing two or more stars at twilight. The Sumner lines thus obtained will, if the bearing of sun and star differ three points or more, give an excellent result.

**13. Change of Variation of the Compass.**—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are

long the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a quarter of a point, but the chart plates cannot be corrected more frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes  $10^{\circ}$  in less than 500 miles, and in the English Channel about  $5^{\circ}$  in 400 miles. The Variation Chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation Chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses.

**14. Local Magnetic Disturbance of the Compass on board Ship.**—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that such disturbance of the compass in a ship afloat is experienced only in a few places on the globe.

Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

**15. Use of Oil for Modifying the Effect of Breaking Waves.**—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, *i.e.*, waves in deep water, the effect is greatest.
2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.
3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing



else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow—*e.g.*, from the cathead—and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

#### 16. *Concise Rules for Revolving Storms:—*

1. Revolving storms are so named because the wind in these storms revolves round an area of low pressure situated in the centre. They have also local names, and are termed hurricanes in the West Indies and South Pacific Ocean; cyclones in the Indian Ocean, Bay of Bengal, and Arabian Sea; and typhoons in the China Sea.

2. In these storms the wind always revolves the same way in the same part of the world, that is, against the movement of the hands of a watch in the northern hemisphere, and with the hands of a watch in the southern hemisphere. The wind does not revolve in circles, but has a spiral movement, inwards, towards the centre.

3. Revolving storms have also, as a general rule, a progressive movement. Within the tropics they usually move from east to west at first, and then curve towards the pole of the hemisphere in which the storm is generated, and afterwards move from west to east.

4. The track which the centre of the storm takes is called the path of the storm, and the portion of the storm-field on the right of the path is known as the right-hand semicircle, and that on the left as the left-hand semicircle of the storm.

5. In the right-hand semicircle, if the observer be stationary, the wind will always shift to the right, and in the left-hand semicircle to the left. This law holds good in both hemispheres.

6. If a vessel be so situated in a storm that running before the wind the path of the advancing storm will be crossed, this is considered to be the dangerous semicircle. This will always be the right-hand semicircle in the northern hemisphere, and the left-hand in the southern.

7. These storms are most frequent in the northern hemisphere from July to November, and in the southern hemisphere from December to May. In the Bay of Bengal and Arabian Sea they, however, occur most frequently about the time of the change of the monsoon.

8. The area over which revolving storms have been known to extend varies in diameter from 20 miles to some hundreds of miles, and their rate of movement in the West Indies averages about 300 miles a day; in the China Sea, Bay of Bengal, and Arabian Sea about 200 miles a day; and in the Indian Ocean from 0 to 200 miles a day, the more stationary storms occurring at the beginning and end of the hurricane season.

9. The indications of the approach of a revolving storm are (1) an unsteady barometer, or even a cessation in the diurnal range, which is constant in settled weather; (2) a heavy swell not caused by the wind then blowing; (3) an ugly, threatening appearance of the sky.

10. In order to judge what is the best way to act if there is reason to believe a storm is approaching, the seaman requires to know (a) in which direction the centre of the storm is situated, (b) in which semicircle the ship is situated.

11. As these points cannot be determined if a vessel is moving with any speed through the water, the first proceeding should be to "stop" or "heave to," and, as it is always best to assume, at first, that the vessel may be in the dangerous semicircle, she should be hove to on the starboard tack in the northern hemisphere, and on the port tack in the southern.

12. If an observer faces the wind the centre of the storm will be from 12 to 8 points on his right hand in the northern hemisphere, and on his left hand in the southern hemisphere; 12 points when the storm begins; about 10 points when the barometer has fallen three-tenths of an inch, and about 8 points when it has fallen six-tenths of an inch or upwards.

13. If the wind shifts to the right the vessel is in the right-hand semicircle, if to the left in the left-hand semicircle, and, if the wind

is steady in direction, but increasing in force, she is in the direct path of the storm.

14. If the seaman has reason to think that his vessel is in the direct path of the storm he should run with the wind on the starboard quarter in the northern, and on the port quarter in the southern, hemisphere until the barometer has ceased falling. If she is in the right-hand semicircle in the northern hemisphere she should remain hove to on the starboard tack, but if in the southern hemisphere run with the wind on the port quarter; if she is in the left-hand semicircle in the northern hemisphere she should run with the wind on the starboard quarter, but if in the southern hemisphere remain hove to on the port tack.

15. Should a vessel not have sufficient room to run when in the least dangerous semicircle, she should heave to on the port tack in the northern, and on the starboard tack in the southern, hemisphere.

16. If in a harbour or at anchor the seaman should be just as careful in watching the shifting of the wind and ascertaining the direction of the centre, as by so doing he will be able to tell on which side of the path of the storm he is situated, and be able to act according to circumstances.

17. Should the centre of a storm pass over a vessel, the wind, after blowing furiously in one direction, ceases for a time, and then blows with equal fury from the opposite direction. This makes a confused pyramidal sea, which is especially dangerous.

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**IN THIS WORK THE BEARINGS ARE ALL TRUE,  
IN DEGREES, FROM 0° (NORTH) TO 360°, MEASURED  
CLOCKWISE.**

**THE LATITUDES AND LONGITUDES GIVEN IN THE  
TEXT ARE APPROXIMATE.**

**THE VARIATION GIVEN IN THE SEVERAL PAGES IS  
FOR THE YEAR 1912.**

**THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.**

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF  
60 TO A DEGREE OF LATITUDE.**

**A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO 100  
FATHOMS, OR THE TENTH PART OF A MILE.**

**THE SOUNDINGS ARE REDUCED TO LOW WATER OF  
ORDINARY SPRING TIDES.**

**HEIGHTS ON THE LAND ARE GIVEN ABOVE HIGH WATER  
OF ORDINARY SPRING TIDES.**

**WHEN SHADING IS USED TO INDICATE COLOURS OF  
FLAGS OR BEACONS, IT IS AS FOLLOWS :—**



Yellow.



Red.



Blue.

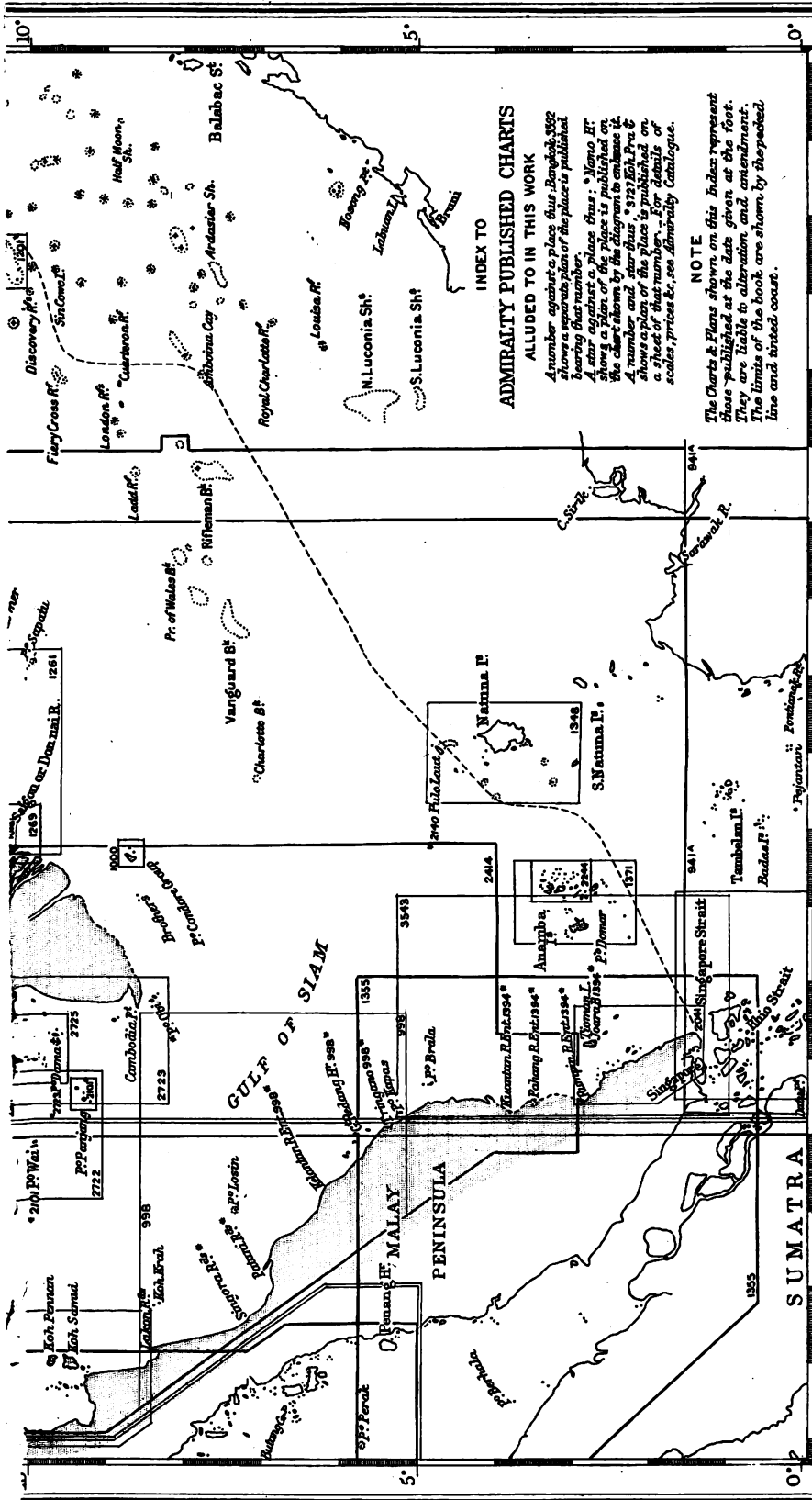


Green.



Black.





# INDEX TO ADMIRALTY PUBLISHED CHARTS ALLUDED TO IN THIS WORK

A number against a place thus Bangkok 3592 shows a separate plan of the place is published bearing that number.  
A star against a place thus : \* Nemo H. shows a plan of the place is published on the chart shown by the diagram to enhance it.  
A number and star thus : 3721 N. I. P. & shows a plan of the place is published on a separate sheet of the chart shown by the diagram to enhance it.  
A star and number thus : 3721 N. I. P. & shows a plan of the place is published on a separate sheet of the chart shown by the diagram to enhance it.

## NOTE

The Charts & Plans shown on this Index represent those published at the date given at the foot. They are liable to alteration and amendment. The limits of the book are shown by the dotted line and tinted coast.

For details of sectors and the latest information respecting the Lights which are included in this work, seamen should consult the Admiralty List of Lights, Part VI. This List is published early in every year, corrected to the preceding 31st December.





# THE CHINA SEA PILOT.

Vol. III.

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## CHAPTER I.

GENERAL REMARKS ON THE VARIOUS COUNTRIES.—WINDS AND WEATHER.—CURRENTS.—PASSAGES.

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**GENERAL REMARKS.**—The China sea is the water area between Singapore strait and Hong Kong, which is bounded on the west by the Malay peninsula, the coasts of Siam, French Indo-China (consisting of Cambodia, Cochin-China, Annam, and Tong King), and the south-west province of China, including Canton and West rivers, and Hong Kong; the description of these coasts and their dangers, with the dangers bordering the main route of the China sea, form the subject of this volume.

The eastern shore, comprising the west coasts of Borneo, Paláwan, and the Philippine islands, as well as the off-shore dangers eastward of the main route up the China sea, form Volume IV. of the new series of the China Sea Pilot.

Towards the centre of the southern portion of the China sea there is a considerable area known to be occupied by numerous coral banks and reefs, only partially surveyed, and therefore dangerous, which should be avoided by all vessels; these, within the pecked line, are dealt with in Vol. IV. under "Dangerous ground."

Mariners are advised to follow the tracks recommended and shown on the charts, as far as practicable.

**MALAY PENINSULA.**—The Federated Malay States of Perak, Selangor, Negri Sembilan, and Pahang, which occupy a large portion of the Malay peninsula, are under British protection; of these, only Pahang on the east coast lies within the limits of this volume.

By the Treaty between Great Britain and Siam, February, 1910, Siam transfers to Great Britain the rights of suzerainty and protection, &c., as she has possessed over the tract of territory lying to the north of the Federated Malay States, and embracing the whole of Tringano,

*General chart 1355.*

all but the north-east corner of Kelantan, the next state northward (and the greater part of Kedah, Perlis, &c., and off-lying islands, all in the straits of Malacca), Great Britain undertaking to facilitate railway construction so that the Siamese railways may be connected with the Federated States. These new territories comprise an area of about 15,000 square miles and a population of about half a million.

The supreme authority in the Federated Malay States is vested in the Federal Council, consisting of the High Commissioner, the Chief Secretary, the Residents, and some of the principal Europeans and Chinese merchants. The Residents are under the control of the Chief Secretary and the High Commissioner. All legislative enactments are submitted to the High Commissioner and the Secretary of State for the Colonies.

The other states are under the Governor of the Straits Settlements as High Commissioner, with a British Adviser at each court.

The states bordering the western shore of the China sea, northward from Singapore, are as follows:—

**Johore.**—The state of Johore occupies the whole of the south extreme of the Malay peninsula, its eastern coast with off-lying islands extending to about lat.  $2^{\circ} 40' N.$ , including the Sungai Endau; it has an area of 9,000 square miles, and a population of 200,000, mostly Chinese. Johore Bharu, on the old strait of Singapore, is the capital. Its foreign relations are controlled by Great Britain in virtue of a Treaty of 1885. Under the Sultan the country is administered by district headmen.

The Sungai Endau flows from the Segamat hills (*Lat. about  $2^{\circ} 30' N.$ , Long.  $103^{\circ} 8' E.$* ), about 30 miles in a direct line from its entrance, but its course traverses quite double that distance. The Sembrong Endau and its tributaries, rising in the Blumut range to the southward, joins the Endau at Pahang village, some 20 miles above its entrance.

Exports are gambier, pepper, sago, tea, coffee, gutta-percha, &c.

**Pahang.**—The state of Pahang, next northward of Johore, commencing in about lat.  $2^{\circ} 40' N.$ , has a seaboard of about 100 miles, the boundary between it and Tringano, the next state northward, being near Bukit Tiga (*Lat.  $4^{\circ} 7' N.$* ); both claim the Sungai Chendar, from whose banks much valuable timber is obtained.

It has an area of about 14,000 square miles and a population of about 120,000.

The Rumpin and Pahang rivers are available for small steam craft, which trade to Singapore during the south-west monsoon period. The Kuantan is available for small steam craft nearly at all times. In the north-east monsoon season most of the small rivers or streams on this coast and the western shore of the Gulf of Siam are usually impracticable.

*General charts 1355, 2414.*

The Pahang is the largest of these streams (*Lat.*  $3^{\circ} 32' N.$ , *Long.*  $103^{\circ} 28' E.$ ), and is fairly wide for about 70 miles, where it is joined by several tributaries which take their rise in the mountains in Selangor and Negri Sembilan. For the entrance, *see* the body of the work.

**Products.**—The staple products are tin, cocoanuts, rice, rubber, sugar, tapioca, coffee, pepper, gambier, and nipah palms. The exports from Pahang river in 1908 were valued at £332,780, and the imports at £197,510.

**Tringano** or Trengganu state, northward of Pahang, has an area of about 6,000 square miles and a population of about 50,000; capital of the same name at the mouth of a small river (*Lat.*  $5^{\circ} 22' N.$ , *Long.*  $103^{\circ} 7' E.$ ). The prevailing religion is Mohammedanism. The industries are of the same character as Kelantan, below mentioned. The country is rich in tin, but it still has to be systematically prospected for minerals.

The capital, Kwala Tringano, is grouped in picturesque fashion about the foot of low conical hills, which afford a pleasant contrast to the generally flat character of the coast country.

**Rivers.**—Tringano possesses a fertile plain backed by ranges of wild, jungle-clad mountains. It embraces the basins of 12 distinct rivers or streams, the principal of which is the Tringano. Above the Kelemang falls this stream is mainly formed by the confluence of the Kerbat and Tringano Ulu, which unite at Kwala Tringano Ulu, not to be confounded with Kwala Tringano, the capital, at its mouth. These falls constitute a formidable barrier to all river traffic, consisting of a flight of eight rapids or cataracts, extending over a distance of 3 miles; the rocky nature continues for another 3 miles, and in the whole 6 miles the drop is from 80 to 100 feet.

The Sungai Kemaman, which traverses the southern portion of the state, is navigable by large river boats from 30 to 40 miles. In both there are places with as much as 60 feet of water, but for the most part they are shallow and rapid.

From November to March, the north-east monsoon blows hard on-shore, closing the ports, but for the rest of the year the fishing population work hard.

**Kelantan.** — The state of Kelantan lies between the state of Tringano and the kingdom of Siam. It has an area of about 5,500 square miles and a population of over 300,000. Kota Bharu, the capital (*Lat.*  $5^{\circ} 38' N.$ , *Long.*  $102^{\circ} 48' E.$ ), has a population of about 18,000. The state has a hereditary Rajah; each village has its own headman, who is responsible to a circle headman, the circles being grouped into districts. The prevailing religion is Shaffi Mohammedanism, the state being divided into 250 parishes.

*General chart 2414.*

There is a Government school at the capital and other schools where English is taught.

There is also a police force of 250 men, commanded by a British officer.

**Products.**—The chief industry is agriculture; products, rice (the principal), cocoanuts (and copra), betel nuts, rubber, resin, rattans, pepper, tapioca, sugar-cane, and maize. A large part of the state is covered with jungle, comprising numerous kinds of valuable timber; it supports a large number of cattle, goats, sheep, and poultry; the mineral resources comprise gold (exports in 1909-10, \$289,272), galena, pyrites, and tin; extensive planting and mining concessions are held by British companies. The manufacturing industries are silk-weaving, boat-building, and brick-making. In 1909-10 exports were valued at \$1,473,413; imports \$1,175,158.

The capital has regular steamship communication with Bangkok and Singapore, and is in direct telegraphic communication with Bangkok and Penang.

**Rivers.**—The chief rivers are the Kelantan, whose basin comprises nearly the whole of the state; the Golok, and the Semarak, the last two flowing into the sea north and south respectively of the Kelantan. Sungai Kelantan has a length of about 120 miles, and at Kota Bharu, 8 miles from the mouth, is 2 cables broad. It is navigable by shallow-draught launches for about 80 miles. The sand-bar at the mouth prevents sea-going craft entering the river; during great floods a temporary deep channel is secured through the bar.

**Climate.**—The climate of Kelantan is described as mild and equable, the heat being tempered by the land and sea breezes, which blow with great regularity during the greater portion of the year. In the coastal plain the temperature varies from 69° to 93°. In the hill country the range is slightly greater, from 62° to 96°.

October, November, and December are the months of heaviest rain, the dry season covering the months of February, March, and April. In 1905, 98·4 inches were recorded in the plains, and 90·5 inches in the hills. In 1906, 108·3 inches were recorded in the plains, and 111·3 inches during eleven months in the hill country.

**SIAM.—Treaties.**—The limits of the kingdom of Siam have varied much at different periods of its history, most of the border lands being occupied by tribes more or less independent. The boundary between Burma and North-west Siam was delimited in 1891.

By the Anglo-French Convention of April, 1904, an agreement made in 1896 was confirmed, and its provision more clearly defined, the territories to the west of the Menam and the Gulf of Siam being recognised as being in the British sphere, and those to the east in the French. Various changes have recently been made in the Franco-Siamese frontier line.

*General chart 2414.*

In 1904, the Luang Phrabang territory to the west of the Mekong was acknowledged by Siam to belong to France, and the provinces of Maluprey and Barsak (west of the Mekong) were also transferred to French rule, so that an area of about 7,800 square miles passed from Siamese possession.

On March 23rd, 1907, a new boundary in this region was accepted by Siam, whereby the provinces of Battambang, Siam Reap, and Sisophon are ceded to France, while the strip of coast to the south, with the port of Krat, remains to Siam. At the same time a rectification of the boundary was made in the Luang Phrabang region whereby a tract of the Laos country was restored to Siam. It was agreed also that the four ports on the Mekong are to be held by France on a perpetual lease. By these arrangements the territory of Cambodia is increased by 7,000 square miles. The Treaty also provides for the future jurisdiction of the Siamese courts over all French-Asiatic subjects and protégés in Siam, under certain conditions.

A Treaty for a modification of British extra territorial rights in Siam for the cession of the Siamese tributary states of Kelantan, Tringano, and Kedah to Great Britain was signed at Bangkok on March 10th, 1910. The three states have an area of about 15,000 square miles and a population of about 450,000, of whom about 300,000 are in Kelantan. *See Federated Malay States on previous pages.*

**The area** of Siam is now about 195,000 square miles, about 45,000 being in the Malay peninsula; an estimate of the population based upon a recent census of 12 only of the provincial circles or monthons places it at about  $6\frac{3}{4}$  million souls. Bangkok is the capital. *See pages 7 and 176.*

**Government.**—The reigning king is Chowfamaha Vajiravudh, who succeeded in 1910. He has two brothers; the royal dignity is nominally hereditary, but each sovereign is invested with the privilege of nominating his own successor.

A British officer occupies the post of Financial Adviser, and there are numerous British officers holding high positions under the Government.

**Provinces.**—The Siamese dominions are divided into 17 monthons or provincial circles, of which 16 have a High Commissioner, with subordinate governors for the several districts, the whole being under the single authority of the Minister of the Interior. The prevailing religion is Buddhism, and throughout the country education is chiefly in the hands of the priests. Bangkok, the capital, possesses several Government schools in which English is taught.

**Menam valley.**—The most important district of Siam is the wide valley of the Menam or Bangkok river, which has been termed the Nile of Siam, since it overflows its banks from June to November,

*General chart 2414.*

and the success or failure of the great rice crop depends on the regularity and amount of this fertilising inundation. The Menam river is the great highway of the country, and around it are the most settled and advanced districts of Siam.

**Lakon Sritamarat and Patani.**—The two monthons or Siamese administrative circles of Lakon Sritamarat and Patani in the Malay peninsula are among the most prosperous and thickly-populated parts of Siam. Their natural resources are considerable; they possess a fertile soil and great wealth of minerals. The town of Singora, the capital, is at the mouth of the Inland sea (page 124); H.M. Consul resides here.

Population of the province of Patani, last census, was 263,448, and of Singora province 460,000.

The total trade of Lakon Sritamarat province was valued at £268,000 in 1908, and that of Patani about £123,000. There are a number of tin mines in Patani. The name of the province in Consular reports is Nakon Sritamarat.

**HARBOURS.**—The chief so-called ports of these provinces, mostly open anchorages, are Naung Chik, Patani, Panarai, Telupin, and Bangnara; also Chumpawn, Langsuen, Bandon, and Koh Samui, farther northward. The ports mentioned, westward of Patani, admit small craft, but there is not much trade. Patani has a bar which prevents any but boats entering; steamers have to lie a long way off, and the bar is constantly extending seaward. Panarai, Telubin, and Bangnara, south-eastward of Patani, are said to be more accessible than Patani to small craft in fine weather, as the bars are of no great extent.

Singora bar, under very favourable circumstances, admits vessels of about 12 feet draught at the highest tides, but none of the regular steamers do so, as the tides are rarely convenient. There is but little doubt that on the completion of the coast railway, Singora will become the port next in importance to Bangkok.

The inland sea or lake on which Patalung is situated has its entrance at Singora; it is a very shallow sheet of water and only navigable by very small steam launches. In many respects it resembles the Zuider Zee.

**COMMUNICATION.**—Vessels of the Siam Steam Navigation Company, Limited, trading from Bangkok, call four times a week (twice each way) off Patani, Panarai, Telubin, and Bangnara; there is also a smaller line calling at some of these ports. There is a stern wheeler in the Inland sea.

**Chumpon (Chumpawn).**—Northward of the two monthons of Lakon Sritamarat and Patani is the monthon of Chumpawn, divided into three provinces, namely, Chaiya, Langsuen, and Chumpawn; the town of Bandon is the capital. Population, 158,000. Mail communication, *see* Bandon, page 130.

*General chart 2414.*

The climate of the northern portion of Chumpawn province resembles that of Bangkok, the end and beginning of the year being more or less dry, and the rain falling chiefly from May to October, and in the southern to December.

The rainfall in Bandon in 1908 amounted to 123 inches, ranging from 33 inches in November to nothing in February.

Pearl fisheries exist throughout the province, more particularly near the town of Chumpawn and Koh Samui.

**Capital.—Harbours.—Bangkok**, the capital of Siam, is situated on both sides of the Menam Chau Fya or Bangkok river, about 25 miles from its mouth, and has a population estimated at from 400,000 to 600,000. At the mouth of the river are the Paknam forts.

The river is accessible up to Bangkok harbour for vessels of about 13 feet draught. The smaller ports on the west side of the Gulf of Siam are mostly closed during the north-east monsoon period. They are referred to with the several provinces. *See Harbours*, on page 6.

**H.M. Consuls.**—There is a British Resident Minister and Consul-General; also a Consul and a Vice-Consul at Bangkok, and a Consul at Singora, and at Chiangmai.

**Climate of Siam.**—The climate of the eastern shore of the Malay peninsula is very equable. There is no dry season, as at Bangkok, but during the months of March, April, and May very little rain falls as a rule. During the north-east monsoon, October to January, the weather is very wet and stormy.

The maximum temperature at Singora in 1909 was 93° (in July), and the minimum 72° (in February); mean temperature probably about 80°.

The rainfall from April, 1909, to March, 1910, was 75.82 inches, of which 20.43 inches fell in November; in Patani 102 inches. Malaria is rather prevalent, especially in the town of Singora.

The American Presbyterian mission have a doctor and a hospital at Lakon Sritamarat, about lat. S. 25° N.

There is a general hospital at Bangkok, to which sailors are admitted. Cholera and dysentery are prevalent at Bangkok.

*See Meteorological tables in Appendix IV., pages 562-568.*

**Products.**—The chief product of Siam is rice, which forms the principal national food, and with teak is the staple article of export. Other produce is pepper, salt, dried fish, cattle, and sesame, while (for local consumption only) hemp, tobacco, cotton, and coffee are grown. Fruits are abundant, including the durian, mangosteen, and mango.

Much of Upper Siam is dense forest; the cutting of teak is an important industry, almost entirely in British hands. Gold exists in some of the rivers, and gem mining is carried on in various districts.

*General chart 2414.*



The mining industry is under the control of the Royal Department of Mines and Geology, created in 1890. The Siam Mining Act of 1901 is in force for most parts of the country. Mining is practically confined to tin, gems (sapphires and rubies), and gold, their relative importance being in the order given.

The total annual production of tin is about 5,000 tons, of a value of about £600,000. There is an enormous field for the expansion of the tin-mining industry in the Siamese possessions in the Malay peninsula.

The other minerals mined for in Siam are copper, lead, iron, coal, oil, and saltpetre. They exist only in limited quantities, and are relatively unimportant.

**Trade.—Shipping.**—Nearly the whole of the trade is in the hands of foreigners, and in recent years many Chinese, not subject like the natives to forced labour, have settled in the country; the foreign trade is centred in Bangkok. In 1909-10 the imports, consisting of treasure, cotton and silk goods, kerosene, sugar, opium, cotton yarn, hardware, iron, machinery, and other articles amounted in value to £5,278,768, and the exports, consisting of rice, teak and other woods, bullocks, pepper, hides, silk, salt, and other articles to £7,755,798. The combined value of the import and export trade in 1910-11, amounted to £13,537,164.

In the year 1910, 923 vessels, of 870,047 tons (106 of 156,634 tons, British), entered. Nearly half the tonnage visiting Bangkok is German. Norwegian vessels have the second place, and Great Britain the third.

**Railways.**—The railway from Bangkok to Paknam, 14 miles, was opened in 1893; from Bangkok north-eastward to Korat (165 miles) in 1900; the Northern line, beyond Ayuthia, has been completed to Sala Ma Puak (viâ Pitsanulok and Utaradit), 438 kilometres from Bangkok. A line from Sawankalok to the main line at Ban Dara is completed. A line from Bangkok to Petriu was opened in 1908; it has since been extended to abreast Kok Si chang. A line to Petchaburi, 95 miles, from Bangkok, was opened in 1903, since extended to Ban cha am. A line to Tachin, 20 miles, from Bangkok, was opened in 1905, and has been extended to Meklong, 20 miles further. The total length, State and private, is probably about 600 miles. See also page 178.

Considerable progress has been made with the Peninsula railway which is being built by the Siamese Government with funds advanced by the Federated Malay States; when completed it will connect the existing Bangkok-Petchaburi line with the line from Johore to Kelantan. A line will cross Bandon river about 5 miles above the town, with a branch to Singora.

**Telegraphs.**—There are about 2,900 miles of telegraph in the country, and Bangkok is in communication with Korat, Nong-Khai,

*General chart 2414.*

Siesophon, Chentabun, Bangtaphan, Chiangmai, and Mehongson; with Moulmein and Tavoy, in Lower Burma; and with Saigon. Siam joined the International Postal Union in 1885, and the parcel post service in 1890.

**Mails.**—There is a bi-weekly service by the vessels of the Siam Steam Navigation Company between Bangkok and Singapore, viâ the ports on the western shore of the Gulf. There is also a bi-weekly service between Bangkok and the ports and places on the eastern shore of the Gulf.

**FRENCH INDO-CHINA.—General description.—**

**Political divisions.**—French Indo-China consists of the possession of Cochin-China, the four protectorates of Tong King, Annam, Cambodia, and Laos, and the territory of Kwang Chau wan, leased by France from China. Hanoi is the capital.

Cochin-China is the most important of these divisions from the point of view of foreign commerce. There is a British Vice-Consul at Saigon, the capital of Cochin-China.

Tong King comes next in the volume of its trade. It contains the second port of Indo-China, Haifong, and the seat of the Government-General of the whole—Hanoi. It is also interesting in view of the possibilities which it affords of reaching the trade of the southern provinces of China. There is a British Consul at Hanoi.

Annam has its capital at Hué, where is the palace of the King who nominally reigns over both Annam and Tong King. Hué has railway connection with the port of Tourane.

Cambodia (capital, Pnom penh) is also ruled over by a King under French protection. It now includes the former Siamese provinces of Battambang and Siamrap, which were ceded to France in 1907.

The Laos Protectorate is still mostly undeveloped, lacking population. It has no seaport, and its foreign trade is carried on either through the other provinces of French Indo-China or through Siam. The Mekong river, which flows through it, is unsatisfactory as a waterway, its course being much interrupted by rapids. The province or country of Luang Phrabang, which forms a portion of the Laos Protectorate, is ruled over by another King under French control. Kwang Chau wan, though administratively a part of Indo-China, is geographically quite distinct from it. It is a free port, and, no customs statistics being available as to its foreign commerce (which is not very large), it is not included in the returns on the next page. It is leased from China, *see* page 16.

The area of French Indo-China is 309,979 square miles.

**Population and language.**—The population of Indo-China at the census of 1906 was 16,315,063, but this figure cannot be relied upon as accurate. More than three-fourths of the population are of Annamite race. The Annamite language is of the same family as the Chinese, and difficult to learn; the Chinese written character is used.

*General charts 2414, 2660a, 2661a.*

The European civilian population was 23,590, nearly all French. The army at its full strength contains about 11,693 Europeans. French is, of course, the language mainly employed by Europeans. All the chief business houses can, however, correspond in English if necessary. The number of Chinese residing in Indo-China is believed to be about 250,000.

**Regulations for entering French ports in time of war.**—The French Government decree, dated 19th July, 1909: The following regulations come into operation from the time of the order for mobilisation, and if necessary they may be brought into force during a period of political tension:—

No vessel other than French vessels of war may approach the French coast within 3 miles without special permission between sunset and sunrise, are to fly their national flag and their number by the International code directly they come within signalling distance.

If they wish to enter the prohibited zone they are to hoist the pilot signal, and remain outside the 3-mile limit until permission is granted by a signal from a signal station or examination vessel.

From sunset to sunrise vessels approaching are to fly their national flag, and have their navigation lights lit. If they wish to enter the zone they are to burn Bengal lights and blow blasts on the siren, and remain outside the 3-mile limit until they receive permission to enter from the examination vessel.

Any vessel summoned by the firing of a blank cartridge is to stop and check her way. If this is disregarded two minutes later a shot will be fired, and at the expiration of a further two minutes fire will be opened upon her. In case of urgency the blank charge may be omitted. At night, any vessel approaching within the 3-mile limit is liable to be destroyed forthwith.

In war in military ports and roadsteads no boats other than those belonging to French ships of war are allowed to be under way under any circumstances between sunset and sunrise. Between sunrise and sunset boats are allowed to be under way when provided with a special permit and under certain restrictions.

In commercial ports the same regulations will hold good, but so arranged as to interfere as little as possible with commercial interests.

All vessels permitted to enter harbour are to take up their allotted anchorage, and may not leave or shift without permission.

**Submarine vessels.—Signals.—Lights:—**

A square flag, with one yellow and one red horizontal stripe (red uppermost), hoisted at any of the signal stations on the coasts of France, Algeria, Tunis, and Indo-China, indicates that submarine vessels are exercising submerged in the vicinity.

Whilst engaged in exercises, whether in harbour or at sea, submarine vessels carry at the stern the national flag, and at the bow the yellow and red flag described above.

*General charts 2660a, 2661a.*

A steam boat or a torpedo boat escorting a submarine vessel submerged, carries at the stern, instead of the national flag, a white ball, and at the bow the yellow and red flag described above.

When submerged submarine vessels are engaged in torpedo practice, the escorting boat will, in addition to a large red flag, show the red and yellow striped flag above mentioned from where it can best be seen.

The escorting boat will generally be accompanied by a swift tender, which will be used to convey orders to passing vessels by means of hailing them, or by the use of a black board.

Every vessel seeing the above-mentioned signals for the vessel being submerged should steer so as to pass at least half a mile astern of the escorting vessel.

Every vessel seeing these submarine vessels should keep out of their way, for, though temporarily navigating on the surface, they should be considered as still engaged in manœuvres.

When a merchant vessel, whose course is likely to render her dangerous to the submarine, is sighted from the escorting boat, the latter will hoist the International code signal M.N. (Stop instantly), and will, if necessary, fire a gun.

The signal M.H. (Stand on) will indicate that the danger of collision has passed, and that the vessel can resume her course.

**When in port.**—French submarines, when in commercial ports, will show, at night, in addition to the usual *white* anchor light at each end of the vessel, *two red* lights over a *white* light, placed vertically 6 feet apart from each other.

No vessel or boat of any description is permitted to go alongside a submarine vessel without special permission.

The only port in this volume at which submarine vessels are stationed at present is Saigon.

**Harbours and rivers.**—The principal harbours are Haifong, on the Kua Kam in Tong King, Tourane and Thuan An (for Hué) in Annam, and Saigon in Cochin-China. Vessels of 13 to 17 feet draught can reach Haifong, viâ the Kua Nam trieu. The Saigon river is navigable to the capital of the same name for vessels of deep draught; very small craft can reach Hué by the Hué river. *See* the body of the work.

The Fai Tsi Long archipelago affords shelter for all classes of vessels during typhoons, and the mouths of the several rivers to vessels of light draught.

The chief routes of inland navigation are the Mekong, which, notwithstanding obstructions and rapids, has been navigated during the favourable season by very light-draught steamers up to Luang Phrabang, about lat. 20° N., or more than 1,000 miles from its mouth; and the Song Ka, or Red river, which can be ascended by very light-draught steamers as far as Laokai, near the Chinese frontier, a distance of some 250 miles.

*General charts 2660a, 2661a.*

Much has been done towards improving the canal and road communications in the deltas, and some small lines of railway have been built.

**Railways.**—The railways of Indo-China, constructed and open to traffic, had, in 1910, a total length of about 830 miles, as follows: The line from Haifong to Hanoi,  $65\frac{1}{2}$  miles; from Hanoi to Laokai, 184 miles; Hanoi to Langson and the frontier of Kwangsi (Yunnan),  $101\frac{1}{2}$  miles; Hanoi to Vinh,  $202\frac{1}{2}$  miles; Tourane to Kwang-tri, via Hué,  $108\frac{1}{2}$  miles; Saigon to Mitho, 44 miles; and the South Annam coast line, from Saigon, which is at present open to Fantit or Phantiet,  $123\frac{1}{2}$  miles; it is to be continued to Nhatrang (the portion between Fan rang and Nhatrang is completed, 1912; the remainder in about 2 years). Langson to Lungchau, 46 miles. A proposed extension of the Hanoi-Langson line, and to continue it to Nanning. Other extensions are intended. The Yunnan railway, an extension of the Haifong-Laokai line to Mengtz and Yunnanfu, a distance of 538 miles, was opened in April, 1910. The Indo-Chinese railways all belong to the French Government.

**Telegraph.**—Within the union there are several thousand miles of telegraph line, with urban and inter-urban telephone systems.

Saigon is connected with Singapore, Haifong, &c., by submarine cable, as mentioned on page 15, with Cochin China.

**Trade.**—The French possessions in Indo-China are united into a Customs Union. In 1910 the imports amounted to the value of 238,686,288 francs (of these goods to the value of 85,199,076 were from France or French colonies); and exports to 290,546,912 francs (66,627,224 represents the value from France or French colonies).

**Produce.—Exports.**—Rice is by far the most important natural product of French Indo-China; maize is taking a leading place; others are pepper, hides, cotton, copra, mats, cinnamon, silk, cardimons, wood, coffee, lac, rubber, &c.

**Imports.**—Cotton tissues, tin, silk tissues, cotton yarn, liquors, manufactured metals, arms, pottery, tobacco, and kerosene oil are the principal imports.

**The coal mines** of Hongai, on the coast north of Haifong, have been worked now for many years with considerable success. The coal is anthracite, and, mixed with Japanese coal, is used by the steamships and local railways. Other deposits are worked at Dong trieu, and elsewhere in Tong King.

**Docks.**—See page 559, Haifong and Saigon.

**Shipping.**—In the year 1910, 891 vessels, of 1,776,838 aggregate tons, entered the ports of Indo-China; in addition to 937 native junks of the aggregate tonnage of 23,087 tons. In 1907 the number of vessels that cleared from Saigon was 824, of a total tonnage of 1,290,430; of these 204 vessels, with an aggregate tonnage of 325,955 tons, were British.

In 1910, a subsidised fortnightly service of steamships was started

*General charts 2660a, 2661a.*

between Haifong and Hong Kong, calling at Kwang chau wan. The coasting trade is mostly restricted to French vessels.

**CLIMATE.**—The climate of French Indo-China resembles that of China in its oppressive summer heat, but the winter is not so cold. See Weather tables in Appendix IV., pages 563, 564.

**ANNAM.**—French intervention in the affairs of Annam, which began as early as 1787, was terminated by a treaty, signed in 1884, and ratified in Hué in 1886, by which a French protectorate has been established over Annam. Prince Buu Lam, who succeeded to the throne on January 31st, 1889, under the title of Thanh Thai, has, in accordance with the wishes of the French Government, abdicated in favour of his second son, Duy-Tan, eight years of age (1907), who is placed under the control of a Council of Regency. The ports of Tourane, Kin hon, and Xuan dai are opened to European commerce, and the customs revenue ceded to France. French troops occupy part of the citadel of Hué, the capital. Annamite functionaries under the control of the French Government administer the internal affairs of Annam.

The area of the protectorate is about 52,100 square miles, with a population of about 5,000,000.

Bin Dinh, the largest town, has about 74,000 inhabitants; Hué, the capital, about 65,000.

**Products.**—The productions are rice, maize, and other cereals, areca nut, mulberry, cinnamon, tobacco, sugar, manioc, bamboo, and timber; also caoutchouc and dye, and medicinal plants. There are about 215,000 head of cattle in Annam, and cattle rearing is of great importance. Raw silk is produced and earthenware manufactured. There are iron, copper, and silver mines in the province of Quang-nam, and coal mines near Tourane.

**Trade.**—In 1908 the imports for consumption amounted in value to £294,080, and the domestic exports to £417,541. The chief imports are cotton-yarn, cottons, tea, petroleum, paper goods, and tobacco; chief exports, sugar, rice, cotton, and silk tissues, and paper. At Tourane, near the coal mines, in 1906, 28 vessels of 24,290 tons entered, and 21 of 17,032 tons cleared.

**CAMBODIA** lies, roughly, between the parallels of 10° 50' and 14° North and the meridians of 103½° and 106½° E., and has an area of about 45,000 square miles; population about 1,300,000, consisting of several indigenous races, 37,000 Malays, 91,000 Chinese, 61,000 Annamites, and 660 Europeans. The present King, Sisowath, in 1904 succeeded his late brother, Norodom, who recognised the French protectorate in 1863.

All the eastern portion of it is an alluvial plain through which the Mekong river runs, overflowing its banks during the five rainy months  
*General charts 2660a, 2661a.*

of the year; westward the country rises somewhat and is covered with dense forests. In the northern part, the Mekong is joined by the overflow of a lake some 100 miles in length.

**Capital.**—The two chief towns are Pnom penh (population about 50,000), the capital of the territory, and Kamput, neither accessible for sea-going vessels.

**Products.—Trade.**—The chief products are rice, betel, tobacco, indigo, pepper, maize, cinnamon, sugar-cane, and coffee. Pepper is grown by 61 villages, with 4,780 planters, the production being 750,000 kilogrammes annually.

Cotton growing is extending; the production is estimated at 9,000, the whole of which is exported. The external trade is carried on chiefly through Saigon in Cochin-China. Imports for consumption in 1908 were valued at £166,203; domestic exports at £44,021.

**COCHIN-CHINA.**—The area of French Cochin-China is estimated at 20,000 square miles; it lies roughly between the parallels of  $8^{\circ}$  and  $11\frac{1}{2}^{\circ}$  N. and the meridians of  $104\frac{1}{4}^{\circ}$  and  $107\frac{1}{4}^{\circ}$  E. The whole is divided into 21 provinces. Its affairs are directly administered by French officials. The towns of Saigon and Cholon have been formed into municipalities. The total population in 1910 was estimated at 2,968,529, consisting chiefly of Annamites. The French population was 4,932, and the French troops numbered 2,537.

**Capital.**—Saigon, the capital, page 199, is situated centrally on the river of the same name, a branch of the Don nai or Fuok Bing Kiang, at about 45 miles from the sea, and is connected with the Mekong delta by several navigable streams. Saigon is a modern town with numerous European buildings, including a citadel and dockyard; it has also a school of medicine and many establishments for medical aid.

The climate of Lower Cochin-China is very unhealthy, owing to the excessive moisture combined with considerable heat. The country near the sea is composed chiefly of mangrove-covered swamps, this joins a reed-covered and marshy plain; farther inland it rises somewhat and is covered with forests. The narrow maritime division of Upper Cochin-China has a pleasant climate, separated into the dry and wet seasons. See Meteorological tables in Appendix IV., pages 563 and 564.

**Products.—Trade.**—The chief product is rice, exported mostly to China, Java, and Europe; other crops are maize, beans, sweet potatoes, nuts, sugar-cane, coffee, pepper, fruits, &c.; cotton, hides, fish, pepper, and copra are also articles of export. River and coast fishing is actively carried on; there are about 73,520 boats on the river and 3,000 on the coast. There are nine rice mills in Saigon and Cholon, turning out each from 450 to 900 tons daily. Commerce is mostly in the hands of Europeans and Chinese.

*General charts 2660a, 2661a.*

Imports consist chiefly of tissues, metals, implements, wines, &c., and the exports, rice, fish, fish oil, pepper, cotton, copra, silk, &c.

In the year 1910 the imports of Cochin-China for consumption were valued at 160,311,811 francs; exports (domestic), 197,910,845 francs.

**Communication.—Telegraph.**—For railways, *see* French Indo-China. There are about 2,670 miles of telegraph. Saigon is connected with Singapore, Haifong, &c., by submarine cable. The Messageries vessels, the steamers of the French National Company, of the Messageries Fluviales, of the Chargeurs Réunis, of the Peninsular and Oriental, and of the Norddeutscher Lloyds call at Saigon regularly.

**TONG KING.**—This territory, annexed to France in 1884, has an area of 46,400 square miles, and is divided into 25 provinces, with two military territories (Chinese frontier) and two principal towns, Hanoi and Haifong, the former being the capital. It has some 8,000 villages and a population estimated at 15,000,000 natives, including Chinese and Europeans. It lies between the southern provinces of China, Kuangsi, and Kwang Tung on the north, Yunnan and Laos on the north-west, and the Gulf of Tong King and Annam to the east and south. The northern part is mountainous and inhabited by various hill tribes; the Song Ka fertilises a large area of the centre, and the marshy coastland southward of its mouth produces great quantities of rice.

The chief town is Hanoi (page 269). This town became on January 1st, 1902, the capital of Indo-China, instead of Saigon.

**The climate** is generally healthy, though the heat is excessive during the rainy season, but the dry season is cool, and is said to resemble that of Nice and the south coast of Spain.

The rains commence in May, and much of the territory is inundated by August. Typhoons are frequent.

**Products.—Trade.**—The chief product is rice, exported mostly to Hong Kong, two crops annually; other products are sugarcane, silk, cardamoms, coffee, cotton, various fruit trees, and tobacco. There are iron and copper mines of good quality. A French company works the coal mines at Hongai, near Haifong. The chief industries are silk, cotton, sugar, pepper, and oils. At Haifong is a cotton mill with 25,000 spindles; at Hanoi another with 10,000.

In 1908 the imports for consumption amounted in value to £2,375,427, the exports (domestic) to £2,307,178. The chief imports are metal and metal tools and machinery, yarn and tissues, beverages, &c.; chief exports, rice, and animal products.

**Ports.**—The principal port is Haifong.

**Communication.—Telegraphs.**—For railways, *see* Indo-China. Hanoi is connected with Singapore by submarine cable, via Haifong and Saigon. The Messageries Maritimes line, fortnightly from Marseilles, calls at Saigon, from whence the mails are distributed by the Messageries Fluviales by the inland waters to all parts. It is visited regularly by two French lines of steam vessels.

*General chart 2661a.*



**The Laos territory**, under French Protectorate since 1893, is estimated to contain 98,000 square miles, with a population of about 1,000,000. It lies roughly between the parallels of  $12\frac{1}{2}^{\circ}$  and  $22\frac{1}{2}^{\circ}$  North and the meridians of  $80\frac{1}{4}^{\circ}$  and  $106\frac{1}{4}^{\circ}$  E.

The capital is Vien Tian. In the country there are three protected states; Luang Phrabang, which has a capital of the same name, is the residence of the King, who is assisted in his government by a French Administrator; the other protected states are Bassac and Muong Sing.

The soil is fertile, producing rice, cotton, indigo, tobacco, and fruits; there are teak forests, from which the logs are floated down the Mekong to Saigon. Gold, tin, lead, and precious stones are found. The country can only be entered by the Mekong, which is barred at Khone by rapids; a railway 4 miles in length has been constructed across that island, and by means of it several launches have been transported to the upper waters.

**Telegraph.**—A telegraph line connects Hué, in Annam, with the towns on the Mekong and these with Saigon.

**CHINESE TERRITORY** (*Lat.  $23^{\circ}$  N., Long.  $114^{\circ}$  E.*).—Eastward of the French province of Tong King are the provinces of Kwangsi and Kwang tung, part of the empire at China. Pak hoi, a treaty port, is situated in the south-western portion of the latter. The Si kiang, or West river, which drains a large portion of the territory, discharges its waters westward of Macao island, runs parallel to the coast at about 60 miles within Pak hoi.

The port of Kwang chau wan lies on the eastern side of Lei chau peninsula; it and the islands of Nau chau and Tan hai, in the approach, are leased to France for 99 years from 1899 (page 362).

The large island of Hainan, separated from the Lei chau peninsula by Hainan strait, is also Chinese territory. Hoi hau, the port of Kiung chau, the capital, is a treaty port, as below mentioned.

China, eastward of Hong Kong colony, is fully described in Vol. V.

**Chinese treaty or open ports.**—Pakhoi, in Tong King gulf, population 20,000; Kongmun, on West river, population 62,000; and Hoi hau (Kiung chau), in Hainan island, 42,000, are treaty ports. Lapa (near Macao) and Kau lung are ports of entry only for Canton. For ports of call, &c., on the Si kiang (West river), see pages 380, 381.

Inland, in the province of Yunnan, are the treaty ports of Mengtz, population 20,000; Szemao, population 15,000; and Teng Yeuh, population 10,000; at the latter is a Consulate officer. In the province of Kwangsi are the treaty ports of Wuchau, population 59,000 (with a Consulate officer); Nanning fu, population 40,000; and Lungchau, population 13,000. Canton (900,000), and Samshui (6,000), westward of it, are also open ports. For the ports farther northward, see Vol. V.

**Railways.**—Canton-Kau lung (Chui Kuang), 112 miles, constructed with British capital by British engineers, opened in 1911. The section in British territory, from Kowloon to Shumchun, is

*General charts 1263, 2661a.*

22½ miles in length. A connection with the Canton-Hankau railway is proposed to be made by a loop round the north of Canton city.

Canton-Hankau railway (Yueh-Han), 730 miles approx. It strikes the Pe kiang just above Pak Kong kiau (50 miles above Samshui), thence along the left bank of the Pe kiang to Shao chau su, thence to Lochang, and thence towards Chiling pass. Construction is well advanced; through traffic from Canton to Lin Kong Hon, viâ Pach-ing, about 74 miles, was open in 1912. There is a branch railway from Canton to Fatshan and Samshui, 32 miles, opened in 1904.

Macao to Fatshan (on the Canton-Samshui line), 75 miles; concession granted to a Portuguese syndicate in 1902; progress not stated.

Sunning railway, westward of Hong Kong. Kongyik to Samkaphor, viâ Sunning, 55 miles; 40 miles open in 1911. A line from Sunning to Kong mun was opened in 1912.

Yunnan railway (Tien-Yueh), Laokai to Yunnanfu, 291 miles, opened in 1910; an extension of the line from Hanoi, built and controlled by the French; metre gauge; completed in 1910.

Yunnanfu to Szachuan, 450 miles, proposed. For northward of Canton, see Vol. V. In addition to the 8,000 miles of railway opened or under construction, there is a railway programme for the further construction of about 8,500 miles.

**HONG KONG.**—The Crown Colony of Hong Kong was ceded by China to Great Britain in January, 1841; the cession was confirmed by the Treaty of Nanking in August, 1842, and the charter bears date April 5th, 1843.

Hong Kong is the great centre for British commerce with China and Japan, and a military and naval station of first-class importance. The administration is in the hands of a Governor, aided by an Executive Council composed of the General Officer commanding the troops, the Colonial Secretary, the Attorney-General, the Treasurer, the principal Civil Medical Officer, and the Director of Public Works and two unofficial members. There is also a Legislative Council presided over by the Governor.

Hong Kong is situated at the mouth of Canton river, about 80 miles south of the city of Canton. The island is an irregular broken ridge about 11 miles in length, and from 2 to 5 miles in breadth, and has an area of about 29 square miles, separated from the mainland by the Lye mun, a narrow but deep pass. The city of Victoria extends about 5 miles along the southern shore of the harbour.

The opposite peninsula of Kau lung on the mainland was ceded to Great Britain by Treaty in 1861, and now forms part of Hong Kong.

By a convention signed at Peking on June 9th, 1898, there was leased to Great Britain for 99 years a portion of Chinese territory, mainly agricultural, together with the waters of Mirs bay and Deep bay and the island of Lan-tao. Its area is 376 square miles, with 100,000 inhabitants.

The population of Hong Kong Colony was estimated in 1910 to  
*General chart 2661a.*

number 350,975, consisting of 11,532 Europeans and Whites, 15 Africans, 4,474 East Indians, 330,624 Chinese and Malays, and 4,332 mixed and coloured, an increase of 7,098 over 1909. This estimate includes the population of New Kau lung and the naval and military forces resident in the colony, calculated for 1910 as 6,795, of which 2,362 belong to the Navy and 4,433 to the Army. (Last census 20th November, 1906.)

**Trade.**—The chief industries are cotton spinning, sugar refining, shipbuilding, rope-making, cement, flour milling, and brewing, also the manufacture of knit goods. Deep sea fishing is important, especially for the new territories.

The commerce is chiefly with Great Britain (about one-half of the total imports and exports), India, Australia, United States, and Germany. Hong Kong is a free port and the centre of trade in many kinds of goods. Among the principal are opium, sugar, and flour, salt, earthenware, oil, amber, cotton and cotton goods, rice, coal, timber, &c. The Chinese tea and silk trade is largely in the hands of Hong Kong firms. There are no official returns of trade, only mercantile estimates, according to which the imports average four and the exports two millions sterling. In 1908 the exports to Great Britain amounted in value to £547,339, and the imports from Great Britain, £2,901,465. *See Trade and Shipping in the body of the work.*

**Communication.**—Hong Kong is connected by telegraph with all parts of the world, and numerous mail steamers make it a port of call. *See also page 510.*

**Caution respecting submarine vessels.**—Notice is hereby given that submarine vessels are being constantly exercised off Hong Kong.

In order to minimise the risk of collision with other vessels, the vessel escorting the submarines will, when the latter are exercising, display a large red flag at the masthead.

Every vessel seeing this signal should steer so as to give the escorting vessel a berth of at least one mile, and also to pass astern of her; when from any cause this cannot be done, the escorting vessel should be approached at a slow speed until warning is given by flags, semaphore, or megaphone, as most convenient, of the danger zone, a good look-out being kept meanwhile for the submarines, whose presence may be only indicated by their periscopes showing above water.

**SIGNALS to be made by vessels approaching Defended ports when inconvenienced by searchlights.**—Any vessel approaching a defended port in the Colony of Hong Kong or in that of the Straits Settlements when searchlights are being worked, and finding that they interfere with her safe navigation, may make use of the following signals, either singly or combined:

- (a) By flashing lamp, *four short flashes followed by one long flash.*
- (b) By whistle, siren, or fog-horn, *four short blasts followed by one long blast.*

Whenever possible, both flashing lamp signals and sound signals should be used. On these signals being made, the searchlights will be worked so as to cause the least inconvenience, being either doused, raised, or their direction altered. The signal should not be used without real necessity, as unless the vessel is actually in the rays of the searchlight it is impossible to know which searchlight is affected.

*Note.*—The signals are designed to assist mariners, and do not render the Government liable in any way.

**COAL.**—Large supplies of coal are obtainable at Bangkok, Saigon, Kam Ranh bay, Tourane, Haifong, and Hongai (Port Courbet); smaller supplies at Hoi hau bay in Hainán, Canton, and Macao. *See* also the body of the work, and coal and telegraph chart No. 1188.

**DOCKYARDS.**—There is a naval dockyard at Hong Kong, a Siamese naval dockyard at Bangkok, and a French naval dockyard at Saigon.

**DOCKING ACCOMMODATION.**—The principal docks for British vessels in this part of the China station are at Singapore (Vol. I.) and Hong Kong.

The places in which docks are situated included in this volume are Bangkok, Haifong, Saigon, and Hong Kong, for details of which *see* Appendix II., pages 559, 560.

**STANDARD TIME.**—The time kept at Hong Kong and Macao is that of the meridian of 120° E., or 8 hours fast on mean time at Greenwich. In Indo-China it is the meridian of 105° E., or 7 hours fast on Greenwich.

**COMMUNICATION.—Mails.**—Over 50 lines of sea-going steamers touch at Singapore. The three great steamship companies trading to the East, the Peninsular and Oriental, the Messageries Maritimes, and the North German Lloyd, connect it with Europe on the one hand and with China and Japan on the other.

Communication is maintained between Bangkok and Singapore by steam vessel weekly. From Saigon there are weekly mail steam vessels to Europe, and constant communication between Hué, Haifong, &c. Steam vessels run between Manila and Singapore and Saigon twice a month, or oftener. There are steam vessels from Hoi hau to Hong Kong and Pakhoi at intervals of three or four days, and occasionally to Haifong, Tourane, Singapore, and Bangkok. *See also* the places referred to in the body of the work.

**Submarine telegraphs.**—The ports mentioned are connected with Singapore by submarine cable, and thence with the world, as follows: Singapore is connected with Hong Kong via Labúan. Saigon is connected with Singapore and with Hong Kong, and also with Haifong. Tourane is connected with Amoy and Hong Kong, with ports north of it, and with Manila. Bangkok is connected by land lines with British India and with Saigon, Hué, Haifong, &c. *See also* the body of the work.

### UNIFORM SYSTEM OF BUOYS AND BEACONS.

—**Indo-China.**—The system of buoyage in Indo-China is similar to that in force on the coasts of France, and is as follows:—

The term *starboard hand* means that side which would be on the right hand going with the main stream of flood, or in entering a harbour, river, or estuary from seaward; the term *port hand* means the left hand side under the same circumstances.

Art. 1. Starboard hand buoys are painted red, surmounted by a conical topmark, and numbered even, commencing from seaward.

Art. 2. Port hand buoys are painted black, surmounted by a cylinder, and numbered uneven, commencing from seaward.

Art. 3. Buoys at the bifurcation of channels are painted black and white in horizontal bands, and surmounted by two cones, bases together.

Art. 4. Buoys at the junction of channels are painted red and white in horizontal bands, and surmounted by two cones, points together.

Art. 5. Buoys marking isolated dangers are painted red and black in horizontal bands, and surmounted by a sphere.

Art. 6. Buoys marking wrecks are painted green, and surmounted by a topmark according to its position, in agreement with Articles 1-5.

Art. 7. The names and numbers on the buoys are painted in white letters.

**Dredgers.**—See Regulations, page 271.

**Chinese waters.**—The following system of colouring buoys, beacons, and distinguishing marks of wreck-marking vessels is adopted in Chinese waters.

The side of the channel is to be considered starboard, or port, with reference to the entrance to any port from seaward.

**Buoys.**—

1. Buoys coloured red mark the starboard side of the channel, and must be left on the starboard hand by vessels entering.
2. Buoys coloured black mark the port side of the channel, and must be left on the port hand by vessels entering.
3. Buoys painted in red and black horizontal bands mark the fairway, and should be passed close-to.
4. Buoys painted in red and black vertical stripes mark the ends of spits, and the outer and inner extremes of banks, shoals, or extensive reefs, where there is a navigable channel on either side of such bank, shoal, or reef. Vessels must not attempt to pass between a buoy thus painted and the danger it marks.
5. Buoys painted red and black chequered mark rocks in the open sea, and also obstructions of small extent having channels on either side of them. When marking the latter, they are placed seaward of the danger. Vessels must not attempt to pass between a buoy thus painted and the danger it marks.
6. When two chequered buoys—red and white, and black and white

—mark an obstruction, the red and white buoy marks the starboard side of the channel, and must be left on the starboard hand by vessels entering; and the black and white buoy marks the port side of the channel, and must be left on the port hand by vessels entering.

7. Wrecks are in all cases marked by green buoys, with the word **WRECK** and a number over it painted on them in white letters; when a wreck lies in the open sea, or in a position where there is a navigable channel on either side of it, the buoy carries no other distinguishing mark, and is in every such case, placed seaward of the wreck.

Wreck buoys marked with an even number must be left on the starboard hand, and those with an odd number on the port hand, by vessels entering.

All other marks on buoys are in addition to the foregoing.

**Wreck-marking vessels** carry by day a red flag or such other mark as may be locally notified, and at night exhibit either one *red* light or a *red* light vertically over a *white* light.

**Beacons** marking channels and dangers are painted in a similar manner to buoys used for the same purpose.

The rules for painting beacons apply in each case to the body of the structure. When a beacon painted a single colour, either black or red, is surmounted by a distinguishing mark, such mark may be painted the same colour as the body of the beacon, or with that colour and white combined, or white alone.

When the body of a beacon is painted in two colours, the same colours only are used for the mark surmounting it.

Beacons on land, to enable bearings to be taken, or to give lines of direction for crossing bars or entering rivers, harbours, &c., are painted so as to make them as conspicuous as possible. Red, black, and white are the only colours used.

**Light-vessels.**—The light-vessels in Chinese waters exhibit a *white* light from the forestay to indicate the direction in which the vessel is riding.

When a light-vessel is out of position a red flag is hoisted at the mast-head, or yardarm by day; at night the usual light is discontinued, and a *red* light is exhibited at each end of the vessel. In the case of a light-vessel whose usual light is *red*, or *red* and *white*, a *white* light will be exhibited at each end of the vessel.

Light-buoys must not be implicitly trusted, as mentioned in preliminary pages.

**Chinese vessels.—Lights.**—The “Regulations for preventing Collisions at Sea” are accepted for general use in Chinese waters by all Chinese vessels of foreign type, but Chinese junks, &c., do not carry the regulation lights.

**Caution.**—Enormous fleets of fishing junks may be met on the

coast of China; these vessels carry no lights, as a rule they have the smallest sail forward, and are stoutly built; serious damage would probably be caused to an iron vessel in collision with one of them. The large trading junks have five masts, with two small sails aft.

**STEAM PILOT VESSELS. — Lights.** — All foreign Governments have agreed to the exhibition of the following lights for steam pilot vessels:—

A steam pilot vessel exclusively employed for the service of pilots licensed or certified by any pilotage authority when engaged on her station and not at anchor shall, in addition to the lights carried by all pilot vessels, carry, at a distance of 8 feet below her *white* masthead light, a *red* light visible all round the horizon, visible at a distance of 2 miles in clear weather, and also the coloured side lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty, and at anchor, she shall exhibit only the two masthead lights.

**Pilot vessels.** — Other pilot vessels, when engaged on their stations, shall not show the lights required for other vessels, but shall carry a *white* light at the masthead, visible all round the horizon, and shall also exhibit a flare-up at intervals not exceeding *fifteen minutes*.

On a near approach the usual side lights are to be lighted, and shall flash or show them at short intervals to indicate the directions in which they are heading, but the green light shall not be shown on the port side nor the red light on the starboard side when hand lights are used.

A pilot boat taking a pilot may use a hand lantern instead of a masthead light, and a lantern with green and red slides in place of the side lights. For full details *see* the Regulations for preventing Collisions at Sea.

**WATER.—Caution.**—On the coast of China no water for drinking or cooking purposes should be procured from the shore, if it can possibly be avoided. If water cannot be obtained by condensation, great care must be taken in selecting the watering place on shore, which it is essential should be above cultivated areas; the water should be boiled before use.

Dysentery and probably cholera, which is particularly prevalent at the end of summer and in autumn, result from drinking impure water. The peculiar way the Chinese manure the fields, the overcrowding in their towns, and a general disregard of ordinary sanitary precautions cause the pollution of the water.

Aërated waters sold by the natives, and ice stored by them, must not be used.

**Diseases.**—In China, besides dysentery and cholera, milder forms of intestinal diseases are common in summer, and occur probably from the promiscuous use of raw vegetables, or from chills caught when lying on deck at night.

There is a peculiar form of intestinal catarrh, popularly known as sprue, which attacks Europeans predisposed to illness; the mucous

membrane is affected, diarrhœa is often profuse, and only fresh milk diet, and often hospital treatment, or removal from the country, can cure the patient.

### WINDS AND WEATHER.\*

**General remarks.**—Over the whole of the China sea, the south-west and north-east monsoons prevail, but in the northern part during both monsoons easterly and south-easterly winds are frequently experienced. Land and sea breezes occur near the coasts; they are experienced more frequently during the south-west than in the north-east monsoon, and prevail most on the coasts of Cochin-China, Paláwan, and Luzon. The north-east monsoon is much the stronger, and the more permanent of the two, being but rarely interrupted, whilst the south-west is particularly irregular, and often very weak.

The winds may be summed up briefly as follows: From November to March the north-east monsoon blows. In April calms precede the change of the monsoon, with variable winds between N.E. and S.E.

In May the south-west monsoon is established on the Asiatic coast, with N.E. to S.E. winds in the middle of the sea, and easterly winds in the northern part.

In June the south-west monsoon is fairly established. In September the monsoon becomes weak; strong winds from South to N.W. occur, often blowing with violence, and accompanied by rain on the coasts of Borneo and Paláwan.

In October the north-east monsoon is established, and blowing fresh in the northern part, except on the coast of Luzon, where it is feeble, with calms and showers from south-west, south of the parallel of 13° N.

In November and December the north-east monsoon is strong, but calms, variable winds, and rain occur, in the eastern portion.

**The north-east monsoon** occasionally sets in as early as the last week in August, but it usually begins in the northern part of the China sea about the end of September or early in October. In the southern part it seldom blows steadily till November; there light southerly or variable breezes prevail for the greater part of October. This monsoon generally (and sometimes without warning) commences with a gale, which frequently lasts ten or twelve days and blows with great violence; therefore when the monsoon is about to change do not anchor in unsheltered positions, and weigh immediately the wind freshens, as otherwise, owing to the swell rising quickly, there is a difficulty in getting the anchor. Although the weather in some years is settled and fine, during September and October, the period of the autumnal equinox is a very precarious one, and storms frequently occur in those months.

In November the north-east monsoon prevails generally, but it

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\* See Admiralty Wind and Current Atlas for the Pacific, &c., also the Meteorological tables, Appendix IV., pages 562-567.



blows more steadily, and with greater strength, in December and January; the weather then is frequently cloudy, with much rain and a turbulent sea, particularly southward of Pulo Sapatu, in lat.  $10^{\circ}$  N.

In February there are generally strong winds and unsettled weather. During March the wind is moderate, with steady weather all over the China sea, inclining to land and sea breezes on the coast of Luzon.

**The south-west monsoon** generally commences in the China sea, about the middle or end of April, and continues to the beginning or middle of October, liable to an acceleration or retardation of about a fortnight. It sets in sooner about the Gulfs of Siam and Tong King along the western shore than in the open sea or near the coasts of China, Paláwan, and Luzon. It also continues longer to the southward of the parallel of  $11^{\circ}$  N. than in the northern part of the sea, where it generally terminates about the first week in September; for whilst north-east and easterly winds are blowing on the China coast, southerly winds frequently prevail between Singapore and Pulo Sapatu until the middle of October, although more often, about Pulo Sapatu, light northerly and variable winds and calms prevail at this period.

In May the winds in the open sea are often light and variable, and easterly or south-east winds are likely to occur for a day or two at a time during the whole of the south-west monsoon, particularly in the northern part of the China sea, where these winds are frequently experienced in both monsoons.

The south-west monsoon is at its greatest strength in June, July, and August, at which period there is at times much rain and cloudy weather all over the China sea; in these months, and also in May, sudden hard squalls sometimes blow out of the Gulf of Siam, as far as Pulo Condore and Pulo Sapatu. When dense clouds are perceived to rise, indicating the approach of these squalls, sail ought to be reduced without delay.

During the strength of the monsoon, the wind draws southward, varying between S.S.W. and S.S.E., in the months of June and July.

From the Gulf of Siam to Cape Padaran, the south-west monsoon blows nearly parallel to the coast; and if close in, a light wind from the land is at times experienced at night, succeeded by a short interval of calm on the following morning. The monsoon breeze then sets in, and generally continues brisk during the day. These land and sea breezes prevail most on the coast of Cochin-China, from Cape Padaran northward to Tong King gulf; for on this coast during this monsoon the sea wind dies away almost every evening, and a land breeze comes off in the night, although not at a regular hour. This is followed by calms or light airs, which frequently continue until noon; the sea breeze then sets in from the south-east.

In September the monsoon falls light and variable.

**Gulf of Siam** (Lat.  $12^{\circ}$  N., Long.  $101^{\circ}$  E.).—The north-east

monsoon in the Gulf of Siam sets in at the end of October, or early in November. It is usually preceded by a month of squally, variable, and uncertain weather, and fogs are prevalent, especially near Pulo Panjang. At the end of November the monsoon is fairly established, bringing with it heavy squalls and gloomy weather on the western shore, whilst on the eastern shore the sky is often unclouded for a week together with winds from the eastward. In the middle of the gulf the wind is north-east.

In November and December, strong squalls, with heavy thunder and lightning, are occasionally met with near Pulo Panjang.

In December and January the monsoon blows with its greatest strength.

Towards the end of January the wind blows more from the eastward, is steadier, and abates in strength.

In February the wind is more constant from E.S.E. than from any other point; it blows between S.E. and N.E. with occasional calms and squalls. Fine weather and smooth water now prevail all over the gulf.

In March the monsoon cannot be depended on. In the middle of the gulf calms prevail with southerly winds near the shore, and occasional land and sea breezes. Towards the end of the month the weather becomes hot and sultry.

April is the hottest month of the year; calms may be expected near the middle of the gulf; land and sea breezes near the shore, and occasional slight squalls. From mid-April to mid-May, southerly winds predominate with calms, light rain, and heavy squalls at times. The south-west monsoon is established about the middle or end of June, preceded by a few weeks of unsettled weather.

In June, July, and August, the south-west monsoon blows strongest, with occasional showers, but generally there is very fine weather along the western shore of the gulf, where also the wind is more southerly; out in the middle there is a rough sea; and along the eastern shore there are strong breezes with much rain, and occasionally a fresh gale.

In September the wind is unsteady, veering between S.W. and W.N.W. in strong gusts. Heavy and continuous rain may be expected in this month.

In October the wind shifts between West and North, and abates considerably in strength; the rain squalls are less frequent. Towards the end of the month the wind settles in the north, and the cold weather and fine season sets in.

The south-west monsoon is scarcely felt close in-shore, between Cape Patani and the Redang islands, its course being interrupted by the high land in that neighbourhood. To the southward of Pulo Kapas it takes the direction of the coast, shifting a few points on or off-shore by day or night, under the influence, alternately, of the sea and land breezes.

**Squalls** are frequent in the south-west monsoon; they rise to the westward, accompanied by a heavy bank of clouds generally in the form of an arch, blow with considerable strength for a short time, and are frequently accompanied by heavy rain; strong gales are unknown in the gulf.

**Lower Cochin-China** (*Lat. 10° N., Long. 109° E.*).—The north-east monsoon sets in towards the end of October, and continues until March, when there are variable easterly winds, and calms up till May; then the first light airs of the south-west monsoon are felt.

In June, July, and August, heavy rains accompany the south-west winds; land and sea breezes prevail when the monsoon is weak.

**Annam.**—Upon this coast the north-east monsoon period is accompanied by rain and northerly winds from December to April. As far south as Cape Padaran the monsoon is generally strong, but southward of the cape it blows with less force and calms are more frequent.

During the south-west monsoon, land and sea breezes are fairly regular; the former is followed by calms or light winds, which generally last up to noon, when the sea breezes set in.

The winds may be said to be variable and weak during the whole year. There are heavy rains during the months of September, October, and November.

**Tong King gulf.**—During the month of October northerly winds are established in the gulf.

From the beginning of November to the end of April the winds are as follows:—

South of the 17th parallel, the wind varies between East and E.N.E.; between the 17th and 18 parallels the winds are variable from the eastward, with breezes sometimes from North to N.W., varied by calms; between the 18th and 19th parallels, the winds are from E.N.E. to E.S.E. near Hainan, and from N.E. to N.N.E. near the coast of Tong King; north of the 19th parallel the winds are from North to East.

The winds are moderate, only attaining on a few occasions, and for a short duration, a force of 6.

From May to August, near the coast, winds from S.S.E. to S.S.W. prevail, with variable winds from West, and sometimes from the opposite direction.

Towards the centre of the gulf, the winds are from S.S.W., S.W., and even W.S.W.; between Hainan and the coast variable winds and calms prevail.

These winds are weaker than those of the north-east monsoon period, rarely exceeding a force of 4.

The weather is generally fine and dry, from the end of October to the beginning of January, and the temperature falls to 54° Fah., with a considerable range during the 24 hours.

From the month of January fogs become prevalent, especially in February and March, the sun scarcely shows itself in these three months, and the temperature is down to 48° or 50° in the morning.

In April, at the end of the north-east monsoon, the weather begins to brighten, and keeps fine until June, when storms and rains make their appearance; the temperature rises to 83°.

In June, with the south-west monsoon, ushered in by storms, the rainy season establishes itself, and lasts up to September, but the month of August is characterised by torrential rains which succeed each other almost without interruption; the temperature is often 95°. From September to November the winds are weak and variable, except for the somewhat frequent occurrence of typhoons, and the weather is also always fine; temperature declines perceptibly. The sea in Tong King gulf, although disturbed at times, does not run high.

The Fai Tsi Long archipelago affords good shelter during typhoons for all classes of vessels.

**TYPHOONS.**—The cyclonic storms of the China seas between China and Japan have long been named typhoons, after a Chinese word, meaning great wind. *See* Signals and Continental depressions, pages 32, 33-37.

The wind in these storms is precisely similar to that in all revolving storms in the northern hemisphere; it revolves round the central area of low pressure in the direction contrary to the motion of the hands of a watch, curving also spirally towards the centre; and at the same time the whole storm-field advances, sometimes with great velocity, and sometimes at scarcely more than the rate of a few miles an hour.

The average rate of progress of the centre of a typhoon in lat. 11° N. is 5 miles an hour; in lat. 13° N., 6½ miles; in lat. 15° N., 8 miles; in lat. 20° N., 9 miles; in lat. 25° N., 11 miles; in lat. 30° N., 14 miles. Southward of lat. 13° N., the rate does not vary perceptibly, but it is more variable the further to the northward, and in lat. 32½° N. it ranges from 6 to 36 miles.

The area over which these storms extend varies from 20 to some hundreds of miles in diameter, and near land the strong winds are so irregularly distributed, that in a place near the centre there may be less wind than at some distance further away from it.

Typhoons are experienced in the Western Pacific and northern part of the China sea, between the parallels of 9° N. and 45° N., and are most prevalent in the months of July, August, September, and October; from December to May they seldom happen, still they have been known to occur in every month of the year. Between May and November these storms commonly follow each other quickly, and there are often several raging at one time; then they cease, and there are none perhaps for several weeks; in August and September a total cessation is most unusual, and the equinox is a very precarious period.

Typhoons are most frequent in the vicinity of Luzon, Hainan, and south-westward of Japan. They are said to blow with the greatest fury when near the land, and their violence is not so great when they pass well to the southward of the coast of China.

The following table, giving the number of typhoons that occurred at Hong Kong during the years 1886-1899, will show the probability of a typhoon being encountered in this portion of these seas, in any particular month:—

Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1	0	1	4	10	24	45	43	57	31	22	6	244

In the Philippine archipelago the typhoons which appeared, either crossing it or passing through it for a greater or less distance, were 468 in number between the years 1880-1901, inclusive, viz.:—

Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
9	2	5	10	25	41	74	74	88	65	51	24	468

Only two of the 468 typhoons which were registered from 1880 to 1900, inclusive, occurred in the month of February; and only 5 in the month of March during the complete period. Their frequency then increases from April, when 10 were observed, to July, when 74 occurred. The maximum of 88 is reached in September, thus giving a yearly average of 4 for this month. From October the number gradually diminishes up to January, for which month but 9 are recorded.\*

As a rule, typhoons commence from east to south-east of the Philippines, whence they advance in courses between West and N.N.W. In May their paths are confined to the tropics. In June they trend towards Hainan island, over Hong Kong and Swatau, or up the Formosa channel. In July, August, and September they become general.

September is especially dangerous, both for the reasons already mentioned, and owing to great irregularity of path caused by the north-east monsoon, which commences in the higher latitudes in fitful puffs. In October they are confined to the tropics by the north-east monsoon; but a few, having their origin well eastward of the Philippines, will make for the south-east coast of Japan. In November they blow only between the parallels 9° to 14° north in the China sea; but, as in October, a few run north-eastward between Liu Kiu and the Bonin

\*See "The Cyclones of the Far East" by Rev. José Algué, S.J., Director of the Philippine Weather Bureau, Manila Observatory, 1904.

islands. In the central and northern parts of the China sea their course lies between N.W. by W. and W. by S., those having much northing generally continuing overland and recurving into the Gulf of Pechili. The typhoons travelling between W. by N. and W. by S. usually break up inshore. Those that cross the north end of Luzon in the south-west monsoon, either usually come through the Bashi channel and make their way up the China coast, or else run up the east coast of Formosa, and then hug the North China shore; both these paths are dangerous.

In 1910, several typhoons of a mild form occurred in June, July, and September in Tong King gulf; one in September passed through Hainan strait, one in June passed northward of Luzon to lat.  $20^{\circ}$  N., long.  $115^{\circ}$  E., when it turned northward, passing westward of Hong Kong.

During the latter months of the year, typhoons that enter the China sea after crossing the Philippines in a low latitude occasionally recurve to the south-westward; others, after crossing the Philippines, recurve in the China sea and re-enter the Pacific, passing between Luzon and Formosa; these latter occur at the beginning and end of the typhoon season, but chiefly in May.

In the typhoons of the summer months, which move towards the W.N.W. or N.W. in the north part of the China sea and reach the coast in the neighbourhood of the Gulf of Tong King, the area over which the winds become strong, with a decided fall in the barometer in front of the centre, is generally small. This is accounted for by the low pressure prevailing over the Gulf of Tong King and the continent beyond it. For the same reason the winds in rear are not only stronger, but long continued.

In the autumn months (September and October) these conditions are reversed, and in front of the storm the barometer begins to fall and strong winds blow at great distances from the centre, whilst in rear the area over which the winds are governed by the depression is comparatively small.

In consequence, a vessel in front of a typhoon moving as stated above, will usually get much shorter notice of the advance of a typhoon from the barometer in summer than in autumn, and while in summer the bad weather lasts for a long time in rear, in autumn it improves rapidly when the centre is past and a strong N.E. monsoon sets in.

The winds round a typhoon centre may be said to be composed of cyclonic winds on the one hand and the prevailing wind on the other.

**Warnings of approach.**—In the China sea the earliest signs of a typhoon are clouds of the cirrus type looking like fine hair, feathers, or small white tufts of wool travelling from east or north, a slight rise in the barometer, clear and dry hot weather, and light winds.

These signs are followed by the usual ugly and threatening appearance of the weather which forebodes most storms, and the increasing number and severity of the gusts with the rising of the wind. In some cases one of the earliest signs is a long heavy swell and confused sea, which comes from the direction in which the storm is approaching, and travels more rapidly than at the storm's centre.

The best and surest of all warnings, however, will be found in the barometer. In every case there is great barometric disturbance. Accordingly, if the barometer falls rapidly, or even if the regularity of its diurnal variation be interrupted, danger may be apprehended.

No positive rule can be given as to the amount of depression to be expected, but at the centre of some of the storms the barometer is often two inches lower than outside the storm-field.

**Practical rules.**—In the typhoon season be constantly on the watch for the premonitory signs, and carefully observe and record the changes of the barometer and wind. *See also Concise rules, page xxviii.*

When there is reason to believe that a typhoon is approaching, the two points necessary for the seaman to know are (*a*) the direction in which the centre of the storm is situated; and (*b*) in which semicircle of the storm the vessel is situated.

In order to ascertain these two points it is necessary that the observer should be stationary; the first thing therefore to be done is to stop head to wind, or heave-to, and as it is always wise to assume the vessel may be in the dangerous semicircle, she should be hove to on the starboard tack (in the northern hemisphere). There should be no hesitation in heaving-to, as the sooner a clear knowledge of the position of the ship in the storm is ascertained the better it will be.

To find the bearing of the centre the observer should face the wind, when the centre will be from 12 to 8 points on the right hand in the northern hemisphere, and on the left hand in the southern hemisphere. At the commencement of the storm allow 12 points, when the barometer has fallen three-tenths of an inch about 10 points, and when it has fallen six-tenths of an inch or upwards, 8 points.

To ascertain in which semicircle the ship is in, watch carefully the way the wind shifts. If the wind shifts to the right the vessel is in the right-hand semicircle, and if to the left in the left-hand semicircle. This holds good in both hemispheres.

*If the ship is in the right-hand semicircle* she should, if in the northern hemisphere, remain hove-to on the starboard tack, but if in the southern hemisphere run with the wind on the port quarter until the barometer begins to rise.

*If the ship is in the left-hand semicircle* she should, if in the northern hemisphere, run with the wind on the starboard quarter, but if in the southern hemisphere remain hove-to on the port tack.

*If in the direct track of the storm* the wind will, without change of direction, increase rapidly in force, whilst the barometer continues to

fall, and then the most advisable course to pursue is to run with the wind on the starboard quarter in the northern hemisphere, and on the port quarter in the southern hemisphere, until the barometer has ceased to fall.

In all cases act so as to increase as soon as possible the distance from the centre, bearing in mind that the whole storm-field is advancing.

In receding from the centre of a typhoon, the barometer will rise and the wind and sea subside. *See* also the preliminary pages; and the Barometer Manual for full details.

**GALES** sometimes blow steadily from E.N.E. or N.E. several days at a time, in September and October, near the south-east coast of China. In the same months they are liable to happen on the west coast of Luzon. Here they mostly commence at North or N.W., and veer to West, S.W., or South, blowing strongly from all these directions, with heavy rain, and a cross turbulent sea; but they seldom continue long.

In May, June, July, and August, severe gales are at times experienced in the north-western part of the China sea, particularly between lat. 14° N. and Hainan island, the approach to Tong King gulf. These gales generally begin at N.N.W. or N.W., and blow with violence out of the gulf, accompanied by dark weather and a deluge of rain; from N.W. they shift to West and S.W., still blowing strong, and abate as they shift more southerly. When these N.W. gales are blowing in the vicinity of Hainan and the coast of Cochin-China, strong S.W. or southerly gales generally prevail at the same time, in the middle of the China sea.

On May 3rd, 1904, at 3h. 30m. p.m., a hurricane passed over Saigon, doing considerable damage to property, in which ships broke adrift and native craft suffered greatly. Such an occurrence at Saigon is rare.

**Squalls** are common during both monsoons, the most dangerous are those known as the Arch squalls. When clouds are seen rising from the horizon in the shape of an arch, sail should at once be shortened, as a heavy gust of wind may be expected; these squalls when the arch is near the zenith are accompanied by heavy rain.

**Climate and rainfall.**—The general remarks on climate will be found with the remarks on the several countries, in the first few pages of the work; for special ports, and for the rainfall, it will be found with the description of those ports, where known. The north-east monsoon period is the healthy season. Winds, weather, and rainfall at certain ports will be found in the Meteorological Tables at the end of the work, pages 562-567.



**TYPHOON AND STORM SIGNALS.**—The undermentioned system of Typhoon and Storm warning signals has been substituted for that formerly in use at the semaphores of the Imperial Maritime Customs on the coast of China, which include Hong Kong and Canton in this volume. It has been established with slight additions by the French Government at the semaphores at Haifong, Tihen sha (Tourane), Padaran, and Cape St. James for the coasts of Cochin-China, Annam, and the Gulf of Tong King, *shown in italics in series 6*, page 35.

Information respecting storms can also be obtained at the following places which have no semaphore: Vinh, Dong Hoi, Tourane, Kin hon, Nhatrang, and Saigon.

The above stations, which are connected with the observatory at Fulien (Phulien), Haifong, will be instructed daily regarding the storm areas.

**Signals.**—When the following signals are made, a red flag with a white star in the centre will be hoisted at the masthead during the day, and replaced by a *red* light at night.

The signals are made by means of shapes used as symbols having numbers corresponding to them as follows:—



These shapes are hoisted at the yard arms of the signal mast, and have the following general characteristics:—

Typhoon and Continental depressions	- -	{	3 shapes at one yard arm showing the position of the centre.
			2 shapes at the other yard arm showing the direction towards which the centre is travelling.
Gale signals	- -	{	2 shapes at one yard arm showing the general direction of the wind.
			1 shape at the other yard arm showing the region threatened.

The time the warning was issued from Zi ka wei observatory at Shanghai, is indicated by one of the above-mentioned shapes hoisted at the masthead, as follows:—

Signal.	Signification.
No. 1 (cone, point down) - - -	Warning issued this afternoon.
No. 2 (ball) - - - - -	„ „ „ morning.
No. 3 (diamond)- - - - -	„ „ yesterday afternoon.
No. 4 (square) - - - - -	„ „ „ morning.

# TABLE I. TYPHOONS AND CONTINENTAL DEPRESSIONS.

(Signals made at the Zei Ka Wei Observatory, Shanghai, to indicate the positions of Typhoons and Barometric depressions.)

## THREE SYMBOLS.

(Representing approximate Position of Centre.)

### SERIES 1 = ▽

#### S.E. DISTRICT.

No.	MEANING.
111	Yap—Pelew Group. Centre between S. and W. (any distance).
112	Guam (from Guam to Yap)—Centre between S. and W. within 240 miles.
113	Bonin Group—Centre between S. and E. (any distance).
114	Far to the E. of Philippine Is.
115	S.E. of Luzon.
116	S.
121	Yap—Centre between S. and E. beyond 240 miles.
122	Sulu sea.
123	S.W. of Luzon.
124	E. " "
125	Central " "
126	W. of " "
131	Yap—Centre between S. and E. within 240 miles.
132	Yap—Centre between N. and E. within 240 miles.
133	N.E. of Luzon.
134	N.W. " "
135	W. " Palawan Is.
136	S.E. " Macclesfield bank.
141	Yap—Centre between N. and W. beyond 240 miles.
142	Yap—Centre between N. and W. within 240 miles.

No.	MEANING.
143	Guam—Centre between S. and E. beyond 240 miles.
144	S. of Macclesfield bank.
145	S. " Paracels.
146	E. " "
151	Guam—Centre between S. and E. within 240 miles.
152	Guam—Centre between N. and E. (any distance).
153	Guam—Centre between N. and W. within 240 miles.
154	Guam—Centre between N. and W. beyond 240 miles.
155	Central Paracels.
156	N.E. of " "
161	Pacific about lat. 15° to 20° N., long. 135° to 140° E.
162	Pacific about lat. 15° to 20° N., long. 130° to 135° E.
163	Bonin—Centre between N. and E. (any distance).
164	Bonin—Centre between N. and W. (any distance).
165	Bonin—Centre between S. and W. beyond 240 miles.
166	Bonin—Centre between S. and W. within 240 miles.

### SERIES 2 = ●

#### S.W. DISTRICT.

No.	MEANING.
211	Off the coast of Cochin-China
212	S.W. of the Paracels.
213	Off Annam.
214	Between Paracels and Hainan.
215	Between Hainan and Annam.
216	E. of Hainan.
221	Haifong to Vinh.
222	Tong King gulf.
223	Off Song Ka delta (Norway Is.)
224	Hainan strait.
225	S.E. of Hong Kong, beyond 120 miles.
226	S.E. " within 120 "
231	N. of Tong King.
232	N.W. of Tong King.
233	S. of Hong Kong.
234	S.W. " "
235	S. of Formosa channel.
236	Coast near Macao.

No.	MEANING.
241	N. of Annam.
242	N.W. of Annam.
243	Central Annam.
244	Coast near Hainan.
245	N.W. of Hong Kong.
246	Off Swatow.
251	S.W. of Annam.
252	S. of Annam.
253	E. of Cochin-China.
254	N. of Cochin-China.
255	Off Amoy.
256	Coast S. of 25th parallel.
261	Vinh to Tourane.
262	W. of Cochin-China.
263	N.E. of Tong King.
264	Gulf of Siam.
265	S. of Pulo Condore.
266	Between Pratas and Lamook Is.

THREE SYMBOLS—*continued.*SERIES 3 = 

## SOUTH-CENTRAL DISTRICT.

No.	MEANING.	No.	MEANING.
311	E. of Liu kiu Is.	341	Lat. 20° to 23° N., long. 125° to 130° E.
312	Central Liu kiu Is.	342	E. of Balingtang channel.
313	S.E. of " "	343	S. of Pescadores islands.
314	S. " " "	344	N. of Formosa.
315	S.E. of Meiacó sima group.	345	Centre of Formosa channel.
316	S. " " " "	346	N. " " "
321	S.W. " " " "	351	Between Naha and Ishigaki jima.
322	N. " " " "	352	Centre of Meiacó sima group.
323	W. of Liu kiu Is. " "	353	Between Formosa and Ishigaki jima.
324	S.E. of Formosa.	354	Off Ockseu.
325	Balingtang channel.	355	Off Turnabout I.
326	Bashee channel.	356	Off Fu chau.
331	Lat. 20° to 23° N., long. 130° to 135° E.	361	
332	Lat. 23° to 27° N., long. 130° to 135° E.	362	
333	S.W. of Formosa.	363	
334	E. " "	364	
335	Central " "	365	
336	N.E. of " "	366	

SERIES 4 = 

## NORTH CENTRAL DISTRICT.

No.	MEANING.	No.	MEANING.
411	N.E. of Liu kiu Is.	441	E. of Linschoten Is.
412	N.W. " "	442	W. " " "
413	S. of Kiusiu I. "	443	S. of Quelpart I. "
414	Off Tung Yung Lt. Ho.	444	N.W. of Shanghai.
415	S.E. of Wenchau.	445	N. " " "
416	S.E. of Hie shan Lt. Ho.	446	Between Saddle Is. and Quelpart I.
421	E. " " "	451	E. of Chusan archipelago.
422	Coast of Cheh kiang.	452	W. of Quelpart I.
423	S.E. of Chusan Is.	453	N.W. of Quelpart I.
424	S.E. of Gutzlaff Lt. Ho.	454	E. of Old Hwang ho mouth.
425	Off the Saddle Is.	455	Central Yellow sea.
426	S. of Shanghai.	456	Coast of Kiangsu.
431	Centre of Eastern sea.	461	
432	N.E. of Hie Shan.	462	
433	S.W. of Shanghai.	463	
434	E. " "	464	
435	W. " "	465	
436	N.E. " "	466	

## THREE SYMBOLS—continued.

## SERIES 5 = ▲

## NORTH AND N.E. DISTRICTS.

No.	MEANING.	No.	MEANING.
511	S.E. of Yezo I. (Hokkaida).	541	S. of Bungo channel.
512	N. part of the Sea of Japan.	542	S. of Kii channel, within 240 miles.
513	E. of Nipon.	543	" " " beyond 240 "
514	Central Nipon.	544	E. of Shantung.
515	W. of Nipon.	545	N.E. "
516	S.E. of Nipon.	546	Pe chili strait.
521	S. part of Sea of Japan.	551	S. of Suruga gulf, near.
522	Approaches to Kii channel.	552	" " " far.
523	" " Bungo channel.	553	S. of "Yokohama," within 240 miles
524	S.W. " of Kiusiu.	554	" " " beyond 240 "
525	W. " " "	555	Gulf of Pe chili.
526	Korea strait, Tsu shima.	556	Liau tung gulf.
531	Centre of Sea of Japan.	561	
532	Inland Sea of Japan.	562	
533	E. of Korea.	563	
534	S.E. of Shantung.	564	
535	S.E. of Tsing tau	565	
536	S. of Tsing tau.	566	

## SERIES 6 = X

## CONTINENTAL DEPRESSIONS.

No.	MEANING.	No.	MEANING.
611	Si-Kiang valley.	642	Fuh kien province, or
612	Upper Yangtze valley.	642	( <i>Indo-China</i> ) N.W. of Annam.
613	Mean " "	643	Cheh kiang province, or
614	Lower " "	643	( <i>Indo-China</i> ) Centre of Annam.
615	Upper Hwang ho "	644	Sea of Japan.
616	Lower " "	645	Eastern sea.
621	Central Mongolia.	646	Crossing Japan.
621	( <i>Indo-China</i> ) N.E. of Tong King.	651	Between N. Formosa and China, or
622	N. of China.	651	( <i>Indo-China</i> ) S.W. of Annam.
623	W. " Lake Baikal.	652	Between N. Formosa and Liukiu Is., or
624	S. " " "	652	( <i>Indo-China</i> ) South of Annam.
625	E. " " "	653	Gulf of Pe chili, or
626	N. of Liau tung.	653	( <i>Indo-China</i> ) East of Cochin-China.
631	Thibet or Western China.	654	N. of Korea, or
631	( <i>Indo-China</i> ) North of Tong King.	654	( <i>Indo-China</i> ) North of Cochin-China.
632	S.W. provinces of China.	655	On Yezo I. (Hokkaida).
632	( <i>Indo-China</i> ) N.W. of Tong King.	656	E. of Nipon.
633	Over Shantung.	661	Central Manchuria, or
634	Over Korea.	661	( <i>Indo-China</i> ) West of Cochin-China.
635	Over Eastern Manchuria.	662	N.W. of Manchuria.
636	Yellow sea.	663	Amur province.
641	N. of Kwang tung province, or	664	Sakhalin I.
641	( <i>Indo-China</i> ) North of Annam.	665	Korea strait, and S. Sea of Japan.
		666	Between Liu kiu Is. and Kiusiu.

TABLE II.

## Two SYMBOLS.

*(Representing direction in which centre is moving.)*

North.	N.E.	East.	S.E.	South.	S.W.
West.	N.W.	Re- curving.	Steady or very slow.	Filling up.	Un- known.

The following additions have been made to the two-symbol signals of the storm-warning code :—

*(Representing direction in which centre is moving.)*

N.N.E.	E.N.E.	E.S.E.	S.S.E.	S.S.W.	W.S.W.	W.N.W.	N.N.W.
Forming.	Splitting in two.	Exceptional intensity.					

The foregoing additional signals will be made from the storm signal station at Newchwang, Taku, Chifu, Chinkiang, Wusung Gutzlaff island, Pagoda anchorage, Amoy, Swatow, and Shanghai (storm signal station). They are not at present in force at any port in this volume.

TABLE III.

## GALES.

## ONE SYMBOL.

*(Representing Locality threatened.)*

	Coast S. of Hainan strait.		Hie shan, and mouth of Yangtse-kiang to Tsing tau.
	Coast from Hainan strait to Amoy.		Shantung, Gulf of Pe chili, and Liau-tung.
	Formosa island, and coast of China from Amoy to Hie shan.		Coasts of Korea, sea of Japan.

NOTE.—The direction of the wind is signalled as in Table II., given above.

TABLE IV.

NIGHT SIGNALS.

A.—GALES.

Wh. Lt.

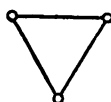


Wh. Lt. Wh. Lt.

Gale expected on the coast north  
of the 30th parallel.

Wh. Lt.

Wh. Lt.

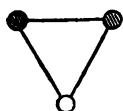


Wh. Lt.

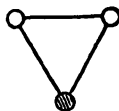
Gale expected on the coast south  
of the 30th parallel.

B.—TYPHOONS AND DEPRESSIONS.

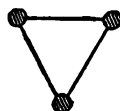
Red Lt. Red Lt. Wh. Lt. Wh. Lt. Red Lt. Red Lt.



Wh. Lt.  
1.

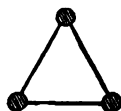


Red Lt.  
2.



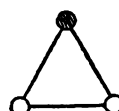
Red Lt.  
3.

Red. Lt.



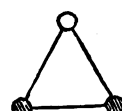
Red Lt. Red Lt. Wh. Lt. Wh. Lt. Red Lt. Red Lt.  
4.

Red Lt.



5.

Wh. Lt.



6.

These signals are used in the same manner as those in Table I. of  
the code to indicate the approximate position of the centre.

CURRENTS AND TIDES.

The principal currents in the China sea are the north-east and  
south-west monsoon drifts. They are both very changeable, their  
direction and velocity depending much upon local circumstances, but  
that during the north-east monsoon is the stronger and the more con-  
stant.

**North-east monsoon period.**—The current in the China sea  
during the north-east monsoon, generally runs to the south-westward,  
with a velocity depending on the strength of the wind. When the

force of the monsoon is abated, or during moderate and light breezes, there is often little or no current.

The current, on the western side of the great mass of reefs included between Prince Consort bank and Ladd reef is usually slack, even during the strength of the monsoon, and at other times is setting, to windward; from Ladd reef to North Danger reef there is invariably a current setting to the north-east. When H.M.S. surveying vessel *Rifleman* was at anchor on the reefs, during both monsoons careful observations were taken of the set of the current, which, for 16 hours out of the 24, invariably set to windward, generally with the greatest force when the monsoon was strongest.

In the western parts of the sea, along the coasts of Cochin-China and the Malay peninsula, the current generally begins to run to the southward about the middle of October (sometimes sooner on the former coast), and continues until April. During the month of March its direction is generally to the south or south-eastward about Pulo Aor, with light easterly winds and calm at times. On the coast of Annam, and adjacent to Hainan island, a current varying from South to S.W. commences sometimes about the middle of September; near the land, from lat.  $15^{\circ}$  N. to about  $11\frac{1}{2}^{\circ}$  N., it increases in strength, but its rate decreases in proportion as it flows southward. During the prevalence of the north-east monsoon, from about lat.  $14^{\circ}$  N. to Cape Padaran, the current near the coast frequently runs 40 or 50 miles, and sometimes as much as 80 miles to the southward in 24 hours; the rate, however, is variable, and it is only in the limits above mentioned that it is occasionally so strong, for its strength abates at Cape Padaran, and it then runs with less velocity to the S.W. towards the Gulf of Siam.

On the southern coast of China the current during the north-east monsoon runs almost constantly W.S.W., nearly parallel to the land; and sometimes with considerable rapidity, when a typhoon or a storm occurs. The current at the distance of 70 or 80 miles from the coast seldom runs so strong as near it; and in depths of 30 or 40 fathoms there is much less current than in shallow water near the shore and amongst the islands. The westerly current sometimes slacks, and contiguous to the land the tidal streams prevail, when not overcome by the force of the current, especially at springs.

Between Formosa and the China coast the current runs to the southward during the north-east monsoon. When strong north-east winds prevail its direction is generally from S.W. to South, between the south end of Formosa and the north end of Luzon; but in light variable winds it often sets to the northward. On the west coast of Luzon the current is changeable, sometimes setting southward along the coast, at other times northward, but always with a decided tendency towards the coast.

*See Admiralty Current charts for the Indian and Pacific oceans, &c.*

**South-west monsoon period.**—Late in April, or early in May the current generally begins to set to the northward, in the southern and middle parts of the China sea, and while the south-west monsoon is strong, continues to run in a north-easterly direction until September; but it is not constant in this monsoon, for at times, when the wind is moderate or light, it is liable to change and set in various directions. After the strength of the monsoon has abated, there is often little or no current in the open sea, running to the north-eastward; and sometimes its direction is to the southward.

Along the coast of Cochin-China, from Pulo Obi to Cape Padaran, the current sets generally E.N.E., parallel to the shore, from April to the middle of October; and during the same period its direction is generally to the northward along the east coast of the Malay peninsula, from the entrance of Singapore strait to the Gulf of Siam. To the northward of Cape Padaran there is but little current during the south-west monsoon, near the Cochin-China coast; thence to Tong King gulf, a small drain is sometimes found setting northward, at other times southward. When a gale blows out of the latter gulf from the north-west and westward, the current sets generally to the south-west or southward, in the vicinity of the Paracel islands and reefs or where these gales are experienced; and this current running obliquely, or contrary to the wind, produces a turbulent and high sea.

On the southern coast of China the current is much governed by the wind; when strong south-west winds prevail, it runs along shore to the eastward, but is seldom strong. Near, and among the islands, westward of Macao, there is generally a westerly current, occasioned by the freshets from Canton river setting in that direction; and which frequently sweeps along the islands from Macao to St. John, between W.S.W. and W.N.W., about one or 2 knots per hour. This westerly current is, however, not always constant during the south-west monsoon, for a weak stream may sometimes be experienced running to the eastward.

**In the Gulf of Siam.**—The currents in the gulf, near the middle are generally weak and variable, but near the land, in the strength of the monsoons, strong sets may be expected. In the south-west monsoon a strong northerly current was found, from Lem Chong P'ra to Samroi-yot point. In the north-east monsoon there is frequently a strong set to the westward across the head of the gulf.

In the neighbourhood of the Redang islands and Pulo Obi, the currents prevalent in the China sea may be expected. The China sea current does not appear to enter the gulf farther than a few miles, but to set across its mouth in both monsoons.

The flood stream of tide from the China sea appears to strike the  
*See Admiralty Current charts for the Indian and Pacific Oceans, &c.*



western shore of the gulf and divide somewhere near Cape Patani; for at the Redang islands the flood sets to the southward, and at Singora and Koh Krah it was found setting to the northward.

**Tides.—China sea.**—The observations on tides in the China sea are neither numerous enough nor complete enough to permit of accurate generalisations being made for the whole area. The following remarks, however, based on the existing evidence, afford some idea of the general tidal movement.

They are affected by a diurnal inequality, especially of height, causing a difference between the heights of successive high and low waters, which varies throughout the lunation, and sometimes attains large proportions.

The difference may be almost imperceptible, or may be so great that the movement of the water between the lower high water and higher low water is reduced to a mere stand in the level of the water, giving the effect of only one high and low water during the 24 hours.

The time of high water is generally the most regular feature of the tides, and follows the time of the moon's transit as usual.

Spring tides depend upon the opposition and conjunction of the moon and sun (full or new moon), and also on the attainment by the moon of its higher declination north or south.

The effect of these two positions of the moon is about equal on the tide, so that when the moon is either new or full, at the same time that it is in the high north or south declination, the spring tide is high and well defined. When the new or full moon occurs when it is on the equator, the spring tide is sometimes almost lost.

The higher water of each day follows either the superior or inferior transit of the moon when she is on one side of the equator, and the opposite transit when she is on the other side of the equator. The particular transit followed by the tide varies in different localities.

In Tong King gulf, when the sun has north declination, the higher tides about springs occur during the day, and when it has south declination, during the night.

The mean tide level on the different coasts varies during the year; in the Tong King gulf it is highest during the north-east monsoon, or from November to March; and also about Kin hon, on the coast of Cochin-China, it is lower in May and June than in March. Tide tables for the ports in Indo-China are published annually by the French authorities, and for Hong Kong by the British Admiralty in the Admiralty tide tables.

*See Admiralty Current charts for the Indian and Pacific Oceans, &c.*

## DIRECTIONS FOR MAKING PASSAGES.

## OUTWARD (NORTHWARD) ROUTES.—FULL-POWERED STEAM VESSELS.

**General remarks.**—Towards the centre of the southern portion of the China sea, there is a considerable area of unsurveyed and dangerous ground, known to be encumbered with coral reefs and banks, which should be avoided. This area is described in Vol. IV., within the limits of the pecked line enclosing the “Dangerous ground.” Vessels are recommended to follow the routes shown on the charts of the China sea, as far as practicable. See the Index for large scale charts when near dangers.

**SINGAPORE TO HONG KONG.**—Both monsoons.

—Mail and other full-powered steam vessels take the Main route; that is, between Pulo Aor and the Anamba islands, eastward of Pulo Sapatu (views on pages 56 and 103), and thence between Macclesfield bank and the Paracel group to Hong Kong.

An alternate route, taken by many of the mail steamers in the north-east monsoon, and recommended for vessels of somewhat smaller power, is, after passing westward of the Anamba islands, to steer about 30 miles westward of the Prince of Wales bank and North Danger reef, thence about the same distance eastward of Macclesfield bank; from abreast the latter the fore and aft sails will usually stand. The current is decidedly favourable in this track, from about lat. 10° N., except possibly when the monsoon is unusually strong.

**Singapore to Gulf of Siam and to Saigon.**—Both monsoons.—Mail and similar full-powered steam vessels take the direct route.

**Hong Kong to northern Chinese ports.**—Direct, but giving a wide berth to the coast of China. See Vol. V.

**Hong Kong to Nagasaki and Yokohama.**—Direct as possible, but during the north-east monsoon keep as close as prudent to the coast of China northward to about Tung yung island. See Vol. V. for coast of China.

**Hong Kong to Manila.**—Direct in both monsoons.

## VESSELS WITH LOW STEAM POWER.

**SINGAPORE TO HONG KONG.**—South-west monsoon.—Vessels with low steam power, in this the fair wind monsoon, also take the Main route, passing between Macclesfield bank and the Paracel group.

During the strength of the monsoon, the Inner route along the *Passage charts 1077, 1078, and charts 2660a, 2661a, and 1263; also “Ocean Passages.”*

coast of Cochin-China may be adopted, with the advantage of obtaining smooth water. Proceeding by the Inner or Cochin-China route, steer from Pulo Aor along the coast to the Redang islands, thence across the Gulf of Siam, and along the coasts of Cambodia and Cochin-China, keeping the latter aboard to Cape Tourane; thence steer for the south-west part of Hainan, coasting along the east side of this island and passing between it and the Taya islands; then steer to make the coast of China about Tienpak, or Huiling san island. The islands thence to Hong Kong may be coasted along at discretion, and shelter may be found amongst them on emergency.

**North-east monsoon.—Palawan route.**—See Vol. IV.

**SINGAPORE TO GULF OF SIAM AND SAIGON.**

**—South-west monsoon.**—Vessels with low steam power, if bound to the Gulf of Siam, having cleared Singapore strait, should shape a course to make the Redang islands, and then steer along the western shores of the gulf.

If bound to Saigon, pass westward of Pulo Condore, and thence to Saigon.

**North-east monsoon.**—Vessels with low steam power generally steer a direct course during this monsoon to the Gulf of Siam and to Saigon; but during the strength of the monsoon, in December and January, it would seem advantageous to follow the route recommended for sailing vessels, viz., east of the Anamba islands if bound to the Gulf of Siam, and east of the Natuna islands if bound to Saigon.

**Hong Kong to northern Chinese ports,** as for full-powered, during south-west monsoon; or as for sailing vessels, Vol. V., in the opposite season, if of very low power.

**Hong Kong to Yokohama and Nagasaki,** as for full-powered vessels, unless of very low power, then the route for sailing vessels should be taken.

**Hong Kong to Manila.**—Direct.

#### SAILING VESSELS.

**SINGAPORE TO HONG KONG.—South-west monsoon.**—Sailing vessels proceeding from Singapore to China, should, as June approaches, use the Main route, eastward of Pulo Sapatu (view on page 103), and between the Macclesfield bank and the Paracel group, the winds being more steady in the open sea than near the coast. As early as April a westerly breeze will sometimes be found blowing out of the Gulf of Siam, and continuing to the Macclesfield bank, from whence easterly winds will be experienced to Hong Kong.

This route becomes precarious if a sailing vessel has not arrived in the vicinity of Pulo Sapatu early in October; for near this island, about the middle of that month, strong southerly currents begin to prevail with light northerly winds, variable airs, and calms, by which *Passage charts 1077, 1078; also 2660a, 1263, and "Ocean Passages."*

many vessels have been delayed for several days, and have made no progress to the northward. Fresh winds from the southward have been met with, even so late as November 1st, but these instances are rare.

Some vessels proceeding by the Main route have carried strong south-west and southerly winds, when others taking the Inner route have at the same time experienced north-east and westerly gales blowing out of Tong King gulf, with dark weather and rain, and have been in danger of being driven among the Paracel reefs; the Inner route ought, however, to be chosen in the strength of the south-west monsoon, for the sea will be smooth, and being near the land anchorage may be obtained if required. The gales out of the gulf are not frequent, and the land may be kept in sight nearly all the time.

Proceeding by the Inner route, follow the directions given for vessels with low steam power taking this route, page 41. If it be taken before the end of March, the passage may be tedious unless in a fast sailing vessel.

The Paláwan passage may be used late in the south-west monsoon, when vessels should steer north of Pengibu (Victory) island, and between Great Natuna and Subi islands, Vol. IV.; thence proceeding as directed for sailing vessels taking this route in the north-east monsoon.

Bound to Hong Kong in the strength of the south-west monsoon, endeavour to make the Great Ladrone island bearing about North, then steer between it and Gap rock of the Kaipong islands; thence between Lingting and the Lema islands, and through Lema channel into West Lamma channel. After the middle of August, when easterly winds are likely to prevail several days together, as they are more or less at all seasons, it will be necessary to make the north-east head of the Lema islands, and proceed in by Lema channel towards West Lamma channel. East Lamma channel is also safe in both monsoons, for although the water is deep, if the wind fall light, anchorage can be obtained, and there is little or no tide.

**SINGAPORE TO HONG KONG—North-east monsoon.**—Sailing vessels leaving Singapore for China during the north-east monsoon may expect a tedious passage if the Main route be adopted; the route recommended is to stand eastward to the Natunas, passing between Midai island and Subi kechil, on which a light is now established, thence working up the China sea along the western edge of the reefs, where the current is generally favourable. Having arrived in the open sea in the parallel of 12° N., northward of the central dangers, charted as “dangerous ground,” it is advisable, instead of beating to windward, to make easting and work up the

*Passage charts 1077, 1078, 2660a, 2661a, and 1263; also  
“Ocean Passages.”*

coast of Luzon as far as Cape Balinhasai, and thence direct to Hong Kong.

Near the change of the monsoon, the Inner route (page 41), along the coast of Cochin-China, is generally the most expeditious, as the south-west monsoon sets in earlier there than in the open sea.

**Paláwan route.**—The passage to China by the coasts of Paláwan and Luzon is the recommended route during the strength of the north-east monsoon. *See* Vol. IV.

**Eastern route.**—An alternative route for sailing vessels, and which affords a leading or fair wind and favourable currents nearly throughout, is viâ Carimata strait, southward of Borneo and Celébes, through Salayar strait, Pitt and Gillolo passages; thence eastward and northward of the Philippine islands. Charts, *see* Index chart.

**SINGAPORE TO GULF OF SIAM AND SAIGON.**  
—**South-west monsoon.**—In this monsoon the winds prevail between S.E. and West in Singapore strait, and sailing vessels will have no difficulty in sailing through to the eastward.

If bound to the Gulf of Siam, having cleared Singapore strait, shape a course to make the Redang islands; and thence keep the western shore of the gulf aboard, passing inside Pulo Lozin and Koh Krah. (*Chart 2414.*)

If bound to Saigon, steer to pass to the westward of Pulo Condore, making allowance for a current setting out of the Gulf of Siam, whilst crossing the entrance of that gulf. Steer thence northward along the edge of the bank that fronts the mouths of the Mekong river, and extends to the entrance of Saigon river, keeping in a depth of 8 to 12 fathoms; if the water shoals under 7 or 8 fathoms haul off to the eastward, and it will immediately deepen, the soundings being regular on the edge of the bank.

Directions for making the land about Cape St. James and for proceeding up the Don nai river to Saigon are given at pages 197-199.

**North-east monsoon.**—Sailing vessels bound from Singapore to the Gulf of Siam in the north-east monsoon generally pass between Great and South Natuna islands, Vol. IV. Fast sailing vessels proceed between the Anamba and Natuna islands, and endeavour to make Pulo Obi; thence for Pulo Dama if bound to Kamput in the Gulf of Siam; or outside Pulo Panjang and Pulo Wai, direct for Cape Liant, if bound to Bangkok. In February and March vessels frequently fall in with an easterly wind off Pulo Aor, that takes them to Pulo Obi.

The directions given for proceeding from Singapore to Hong Kong in the north-east monsoon (page 43) apply also to vessels bound to the Gulf of Siam or to Saigon, until they have arrived to the eastward of Natuna islands, either by passing between the Great and South Natuna, or by the Koti passage, Vol. IV.

*Passage charts 1077, 1078; also 3660a, 1263, and "Ocean Passages."*

**If bound to the Gulf of Siam** proceed in a north-easterly direction to about long.  $111^{\circ}$  or  $112^{\circ}$  E., which can easily be done, as the wind is invariably from North to N.N.W. as far as the meridian of Cape Sirik, when it generally veers to the north-eastward; thence towards Pulo Obi. Little or no current will be experienced until lat.  $6^{\circ}$  or  $7^{\circ}$  N. is gained; then it will be found setting strong to the south-west, governed considerably by the prevailing winds.

In April and May the best passages to the Gulf of Siam are made by keeping the Malay coast aboard; but expect squalls, calms, and rain; a weak current begins to set north-eastward about this period.

**If bound to Saigon** proceed north-eastward to about long.  $112^{\circ}$  E., thence to make Cape Tiwan. From lat.  $7^{\circ}$  N. until about 70 miles eastward of the mouths of the Mekong or Cambodia river, a strong current will be found setting to the south-west governed considerably by the prevailing winds, for when strong gales blow in the early part of this monsoon, the south-westerly current is stronger, and often runs 3 knots an hour. The tidal streams are regular, and set strong near the Cochinchina coast during both monsoons.

In the latter part of March and April an easterly wind is often found eastward of the Anamba islands, that will take a vessel to Pulo Condore; thence work to Cape St. James westward of that island, keeping towards the Cambodia coast, which is very low, and can seldom be seen at night.

From abreast the mouths of the Mekong or Cambodia river, the ebb stream will be found setting to windward, greatly assisting vessels standing in-shore; but they should not stand near these mouths during the flood stream, and on no account shoal the water to less than 12 fathoms in the night. The lead should never be neglected when standing towards this low land, which may be seen from a distance of about 10 miles in clear weather.

The north-east monsoon often blows very strong on the parallel of Pulo Sapatu, and between it and the Cochinchina coast, in December, January, February, and sometimes March, continuing for two or three days with a heavy sea and strong current, the sky being generally thick and hazy throughout. A gradual rise in the barometer is a sure indication of an increase in the strength of the monsoon.

Should the monsoon prove too strong to contend against, vessels may bear up for Pulo Condore, and anchor in Pulo Condore harbour, where good shelter will be found.

**Hong Kong to northern Chinese ports.**—See Vol. V.

**Hong Kong to Yokohama.**—In the north-east monsoon, work along the coast of China as far as Breaker point, Vol. V., and then stand across to the southern end of Formosa, working up on the eastern side of that island. But towards the end of that monsoon stand at once across the China sea, and on nearing Luzon, where the *Passage charts 1077, 1078; also 2660a, 1263, and "Ocean Passages."*

wind is more from the eastward and sometimes from south-east, tack and stand north-north-eastward with a strong favourable current.

In the south-west monsoon, run up the coast of China as far as Tung yung island, then shape a course for Akuisi sima, one of the Linchoten group, and pass through any of the channels between the islands southward of Japan in preference to Van Diemen strait, where dense fogs are prevalent, whilst further seaward in the Japan stream the weather is fine and bright.

**Hong Kong to Nagasaki.**—In the north-east monsoon as to Yokohama. In the south-west monsoon, direct.

Low-powered steam vessels in the north-east monsoon steam along the coast of China to Tung yung, thence steer to pass between Me sima and Tori sima.

**Hong Kong to Manila.**—In the north-east monsoon make for the coast of Luzon at about Piedra point, lat.  $16^{\circ} 18' N$ . The current sets strongly to leeward, but decreases near Luzon. From the latitude of Piedra point, steer southward for Manila bay, giving the coast dangers a wide berth. *See Vol. IV.*

In the south-west monsoon, take every advantage of the wind shifting south-eastward or eastward to make southing. From Macclesfield bank a vessel is certain to fetch Manila; indeed, did not the wind back from S.W. to South and S.S.E. Manila might be fetched on one tack. If passing to windward of Scarborough shoal caution is necessary on account of the current setting to leeward. With a southerly wind make Lubang island and the land southward of Manila bay.

#### HOMeward (SOUTHWARD) ROUTES.—FULL-POWERED STEAM VESSELS.

**HONG KONG TO SINGAPORE.**—**South-west monsoon.**—Full-powered steam vessels after leaving Hong Kong, and passing about 30 miles west of Paracel islands and reefs, should, if the monsoon be strong, steer to pass within sight of the land in the vicinity of Kulao Rai, keeping about 10 miles off-shore as far as Cape Padaran, when a course should be steered to pass about 3 miles east of Pulo Aor (*see view, page 56*); thence to Singapore strait. Or, from westward of the Paracels, course may be shaped direct for Cape Varella light.

At night in tolerably clear weather a vessel may pass near to Pulo Cecir de Mer, westward of the Catwicks and Pulo Sapatu, thence to Pulo Aor. During thick weather it is advisable to pass eastward of Pulo Sapatu.

Or the Main route may be taken as in the north-east monsoon.

**North-east monsoon.**—Full-powered steam vessels (in this the fair wind monsoon) on leaving Hong Kong, take the Main route, between Macclesfield bank and the Paracel group, thence eastward of Pulo Sapatu and Pulo Aor to Singapore.

*Passage charts 1077, 1078; also 2660a, 1263, and "Ocean Passages."*

An alternative route is to pass about 30 miles westward of the Paracels, as in the south-west monsoon; thence to pass 15 to 20 miles east of Cape Varella, and east of Pulo Sapatu; thence to Pulo Aor, and Singapore strait. This route is said to be generally adopted, a favourable current being found along the coast. Some vessels take this route in both monsoons. (*Remark Book, Royal Arthur, 1910.*)

#### VESSELS WITH LOW STEAM POWER.

**HONG KONG TO SINGAPORE.—South-west monsoon.**—Vessels with low steam power usually adopt the Inner route (page 41), by the Cochin-China coast, as from Singapore to Hong Kong.

The route by the Paláwan passage, Vol. IV., may also be taken in these months.

**North-east monsoon.**—Vessels with low steam power take the Main route between Macclesfield bank and the Paracel group, allowing for the south-westerly set when leaving the China coast; thence eastward of Pulo Sapatu and Pulo Aor to Singapore. See views on pages 56 and 103.

**GULF OF SIAM AND SAIGON TO SINGAPORE.—South-west monsoon.**—Vessels with low steam power, if proceeding from Bangkok to Singapore, keep along the western shore of the gulf to Great Redang island (*chart 2414*); thence inside Pulo Brala and close along shore to Singapore.

From Saigon, steer along the Cambodia coast as far as the Brothers or Pulo Obi, then across the Gulf of Siam to the Malay coast, and passing inside Tioman and Pulo Sibiu, keep along the coast to Singapore strait.

**North-east monsoon.**—Vessels with low steam power, from Bangkok steer along the eastern side of the gulf past Pulo Wai to Pulo Panjang; thence eastward of Pulo Brala to Singapore strait.

If from Cape St. James, pass eastward of Pulo Condore and thence direct to Pulo Aor and Singapore strait.

#### SAILING VESSELS.

**HONG KONG TO SINGAPORE. — South-west monsoon.**—It is a common practice for sailing vessels to work down the China sea at all periods of the south-west monsoon. After leaving Hong Kong the usual course is to stand towards Hainan, which will be often fetched without tacking, as the wind frequently blows for days together from the south-east or eastward in that part of the China sea; from thence across Tong King gulf to the Cochin-China coast. Land and sea breezes and smooth water generally prevail close to that

*Passage charts 1077, 1078; also 2661a, 2660a, 1263, and  
“Ocean Passages.”*



coast, for which reason it is usual to work down as close to the shore as possible, taking advantage of every slant of wind, but being careful not to get too far off the land. It is sometimes possible to get as far to the southward as Cape Padaran in this way, but generally after passing Cape Varella the monsoon is found blowing very fresh, with frequent hard squalls out of the Gulf of Siam, rendering it impossible to work much to windward. From Cape Varella, or from Cape Padaran if a vessel has been able to fetch it, stretch away to the southward—making a tack if necessary, to weather the West London or other shoals—till the coast of Borneo is reached, along which work, and pass out through any of the South Natuna channels, Vol. IV. Stand across to Singapore, and to make sure of your land-fall, keep well to the southward before closing Bentán, so as to allow for the current which runs sometimes as much as 2 miles an hour to the northward.

If the wind should be to the south-westward on leaving Hong Kong, a good passage may occasionally be made in the early part of the monsoon by standing to the south-eastward as far as lat.  $15^{\circ}$  N. and long.  $115^{\circ} 30'$  E. Thence south-westward of the Macclesfield bank, to Pulo Sapatu or to Cape Padaran, and across the Gulf of Siam to Pulo Aor and Singapore.

**North-east monsoon.** — Sailing vessels bound from Hong Kong or Chinese ports to Singapore, or to Gaspar or Banka straits, should in March and April adopt the Main route between Macclesfield bank and the Paracel group, which is the most expeditious in these months, allowing for the south-westerly set when leaving the China coast. In passing Pulo Sapatu they should borrow to the eastward towards the Prince of Wales and other banks, where the winds are more favourable than farther to the westward.

Vessels may pass either to the eastward or westward of the Catwick islands and Pulo Cecir de Mer. Thence passing westward of the Charlotte bank and the Anamba islands, they should steer to make Pulo Aor. See view on page 56.

Should the weather be thick, and a fresh breeze blowing, when near Pulo Aor, round to under its lee, and wait a convenient time to bear up for the strait. The current between this island and the east point of Bentán sets about S.S.E., by which it often happens that vessels leaving Pulo Aor steer too much to the southward, and are swept with the current and the ebb stream coming out of Singapore strait so far to the leeward of Bentán that they have been obliged to proceed round it, and come up through Rhio strait.

In March, during the latter part of this monsoon, the winds are steady from the eastward, the weather settled, and the current weak. In April the prevailing winds are also from the eastward, but are much lighter and accompanied with calms and squally weather; from the *Passage charts 1077, 1078; also 2660a, 1263, and "Ocean Passages."*

latter end of this month to about the middle of May the monsoon gradually breaks up.

### **GULF OF SIAM AND SAIGON TO SINGAPORE.**

—**South-west monsoon.**—Sailing vessels from Bangkok to Singapore should keep the western shore of the Gulf of Siam aboard (*chart 2414*), passing inside the Redang islands, Pulo Kapas, and Pulo Brala. Southward of Pulo Kapas, keep in-shore to avoid the current, and take advantage of the land and sea breezes.

From Saigon many good passages have been made by keeping the Cambodia coast aboard as far as the Brothers or Pulo Obi, and then crossing the Gulf of Siam with a strong north-westerly wind until the Malay coast is reached. Afterwards, keeping close in-shore, passing inside of the Tioman group, Siribuat, and Pulo Sibü, and thence to Singapore strait, taking advantage of the tidal streams, and the land and sea breezes which prevail during settled weather in this monsoon.

(The in-shore channel extending from Pulo Sibü to Siribuat, and formed by a chain of islands and rocks parallel to the mainland, is a good and safe one, having but few hidden dangers, and good anchorage all the way through. *See page 54.*)

The above route is generally adopted from Siam and sometimes from Saigon; but the passage eastward of the Great Natuna, described generally on page 49, is considered the best, particularly for large vessels. *See Vol. IV.*

Vessels leaving Saigon, from off Cape St. James, should steer to the south-westward until the regular monsoon breaks them off to the south-east. This may be accomplished by taking every advantage of the North and N.E. winds, which frequently blow at night, and in some parts of the day, within a short distance of the coast. These local winds often carry vessels 40 or 50 miles south-westward of Pulo Condore without any interruption.

While standing to the south-eastward the full strength of the north-easterly current will be met with about the Charlotte bank; it gradually decreases and becomes slightly favourable when north-eastward of the Great Natuna. In this locality S.E. and easterly winds will generally be met with, and fast sailing vessels frequently pass through the channel between Subi and Midai island (*Vol. IV.*), and into Singapore strait. There is now a light on Subi kechil, south side of the channel between Subi and Midai and Great Natuna, which channel, since the survey of it, is safe for all classes of vessel. *See the charts or Vol. IV. for details.*

Strong westerly winds, with rain, frequently blow during the early part of this monsoon, and from this cause or from proceeding 2° or 3° eastward of the Great Natuna with scant southerly winds after leaving the Cambodia coast, dull sailing vessels have often made the northern *Passage charts 1077, 1078; also 2660a, 1263, and "Ocean Passages."*

part of Borneo about the meridian of Cape Sirik. When this is the case, make for Api passage (Vol. IV.), keeping the north-west coast of Borneo aboard from Tanjong Api southward until the Burong islands are reached. This will be accomplished without difficulty, for strong land and sea breezes prevail, and the current is weaker near the coast. (Many vessels, through leaving the coast of Borneo too soon, have fetched no higher than Pulo Aor or Pulo Tioman.)

The current in the offing runs strongly to the northward and through Api passage. Vessels coming through this passage should keep the northern side when possible towards Merunding island, and not shoal at night to less than 13 fathoms water on the southern side between Tanjong Datu and Tanjong Api; the latter point has shoals steep-to at  $1\frac{1}{2}$  miles off, but beyond that distance there is not less than 5 fathoms between it and Tanjong Datu. Vessels should be ready to anchor in the passage or off any other part of the coast, as the tidal streams are greatly influenced by the current, which often changes without warning.

Leaving the Burong islands, pass either northward or southward of the Tambelan group. Should the wind be scant from the south-west after leaving these islands, endeavour to make Pulo Panjang, off the east side of Bentán island.

**North-east monsoon.**—From Bangkok, the passage down the gulf will frequently be shortened in the north-east monsoon, by sighting Kusrovie rock, and passing between Koh Tang and Koh Tron. Thence keep well to the eastward of Pulo Panjang, and if bound to Singapore the passage will be made quicker by steering well out into the China sea; thence to pass about 20 miles eastward of Pulo Brala, and eastward of Pulo Aor (*see* views on page 56); from the latter steer for Barbukit hill, so as to allow for the southerly current setting across the strait.

Approaching Pulo Tioman at night or in thick weather, a good look-out should be kept and allowance made for the current setting to the south-westward, as vessels have several times been found close to the north end of that island when the reckoning has placed them well to the eastward of it.

From Saigon, when off Cape St. James, shape a course to pass eastward of Pulo Condore, and thence direct to make Pulo Aor. From Pulo Aor to Singapore proceed according to directions previously given, for Hong Kong, page 48.

**Local passages, Bangkok and Saigon, *see* page 180.**

## CHAPTER II.

## SOUTHERN PART OF THE CHINA SEA.

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Variation nearly stationary.

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EAST COAST OF THE MALAY PENINSULA FROM TANJONG SITAJAM TO PULO BRALA (*Lat.  $4^{\circ} 50'$  N.*), WITH THE ISLANDS AND DANGERS BORDERING THE MAIN ROUTE; ALSO THE ANAMBA ISLANDS.

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*Chart 3543. Var.  $1^{\circ} 20'$  E.*

**MALAY PENINSULA. — East coast. — General remarks.**—The coast southward of Tanjong Sitajam, as well as the directions for leaving and approaching Singapore strait, are described in China Sea Directory, Vol. I.

The east coast of the Malay peninsula from Tanjong Sitajam (*Lat.  $1^{\circ} 31'$  N., Long.  $104^{\circ} 17'$  E.*) to abreast Pulo Varella, is mostly low and wooded, its general direction being north-north-west. Near the coast, especially off the points, there are rocks, both above and below water, but they appear to lie within the 3-fathoms line of soundings, with the exception of Gading rocks, near Blair harbour; so that when northward of Rumenia shoals, situated about 10 miles south-eastward of Tanjong Sitajam, the coast in most parts can be safely approached by the lead. The space between Tanjong Sitajam and Sungi Sedili Kechil, was sounded over by H.M.S. *Saracen*; no danger was discovered, and the depths were found to decrease gradually towards the shore.

Sailing vessels from Siam, bound to the southward against the south-west monsoon, generally find it most convenient to keep as close as possible to the Malay coast, where regular tidal streams prevail whilst a constant northerly current is found a few miles from the coast. It must be borne in mind, however, that the coast has not been closely surveyed.

**Off-lying islands.**—**Pulo Eu** (*Lat.  $2^{\circ} 7'$  N., Long.  $104^{\circ} 14\frac{1}{2}'$  E.*), a round bluff rock, is the south-easternmost of a chain of islets and

*General charts 1355, 2660a*

*Chart 3543. Var. 1° 20' E.*

rocks which lie parallel to and about 12 miles from the east coast of the Malay peninsula.

**Islets.**—**Ambong reef**, the depth on which is not stated, lies 7 miles north-west of Pulo Eu ; and nearly in a line between them lie four islets, or rocks above water, named, respectively, Chupa, Chondong, Gantang, and Belelei ; no soundings have been obtained near them.

**Lima island**, lying about  $1\frac{1}{2}$  miles north-west of Ambong reef, is nearly half a mile in extent, having two rocks above water, named Raket, about half a mile east-south-eastward of it ; another rock, above water, lies just to the northward of its west extreme, and a similar one named Sangul, nearly a mile west-north-west from the island ; they all appear to be on the same reef.

**Channel.**—There appears to be a safe channel,  $2\frac{1}{2}$  miles wide, between the islands and reefs mentioned and the Sibul group, with depths of 9 to 14 fathoms.

**SIBU ISLANDS** consist of one large and several small islands and rocks.

Sibu island (*Lat. 2° 12' N., Long. 104° 4' E.*), the northernmost, situated about 5 miles from the coast, is a narrow island three miles in length, with a hill, 555 feet high, near its south end, overlooking a small bay, from the western point of which a bank dry at low water extends about half a mile.

Middle Sibu, and two islets or rocks named Sibu Kukus and South Sibu, together with other rocks, both above and below water, extend in a south-easterly direction from Sibu, for a distance of 2 miles.

**Reef.**—A reef, with depths of a half to 3 fathoms, fronts the western and south-west sides of the Sibu group to about  $1\frac{1}{2}$  miles in places, except at the north-west end of Sibu island, which is steep-to. Close to the north-east point of Sibu is a rock upon the inner part of a narrow ledge, which projects in a northerly direction about 2 miles ; over this bank are depths of 4 to 5 fathoms, with 7 to 8 fathoms on either side of it.

**Sibu channel**, between the Sibu islands and the mainland, is about  $2\frac{1}{2}$  miles wide in the navigable part, with general depths of 6 to 8 fathoms. The depths decrease regularly towards the main, but shoal suddenly from 9 or 10 fathoms to 3 fathoms on Sibu reef.

*See Directions, page 54.*

**PULO TINGI** (*Lat. 2° 18' N., Long. 104° 6' E.*), 2,046 feet in height, situated 5 miles north-north-eastward from Sibu island, is about  $3\frac{1}{2}$  miles in length and 2 miles in breadth ; on its north side is a small bay, on the shores of which there is a village.

*General charts 1355, 2660a.*

*Chart 3543. Var. 1° 20' E.*

Water is obtainable on the west side of Tingi; its wells are dry at times, about August.

**Anchorage** is charted in Pinang bight, in about 7 fathoms, on the south-east side of Tingi.

**Islets and rocks.**—A cluster of islets and rocks extend nearly 2 miles south and south-eastward from Pulo Tingi, the two outermost of which are named the Sembang islands; a sunken rock is charted nearly half a mile eastward of Lantin, the next island northwards.

About half a mile from the north-east shore of Tingi lies Ibul islet, with Peniambang islet between it and the shore; sunken rocks extend a short distance east of Ibul.

About  $1\frac{3}{4}$  miles off the north part of Pulo Tingi lie Gebang rocks. In fine weather these rocks are visible at low water spring tides, and there are heavy breakers on them in the north-east monsoon. South-westward of the Gebang rocks is Siam knoll of 3 fathoms, lying about one mile off the north-west part of Tingi.

**Morau rocks**, or Arethusa reef, is charted as a reef about half a mile in extent, with a small islet on its western side, about midway between Morau point on the main and Tingi island; it is apparently steep-to.

**PULO BABI** (*Lat. 2° 26' N., Long. 103° 58' E.*), lying 9 miles north-west from Pulo Tingi, is  $2\frac{1}{2}$  miles in length, and three-quarters of a mile in breadth. Near its south end are two peaks, the northern of which is 911 feet high; some rocks lie close to its southern shore.

Mid Babi, an island about half a mile in extent, with high rocks close to, lies nearly  $1\frac{1}{2}$  miles north-westward of Babi, and three-quarters of a mile beyond, in the same direction, is North Babi.

Regular depths were found between Pulo Babi and the mainland, there being from 6 to 8 fathoms, mud, in mid-channel, decreasing gradually to 5 fathoms, sandy bottom, at  $3\frac{1}{2}$  miles from the main; soundings are few here on the charts.

**Water.**—There are three springs of clear fresh water on Pulo Babi, the principal one being on the north-west point of the island, southward of a small patch of mangrove jungle.

**Tikus rock**, above water, with detached rocks around it, lies  $3\frac{1}{4}$  miles eastward from the southern part of Babi.

**Sakit Mata** is a rock awash, lying 88° true, distant nearly  $2\frac{1}{2}$  miles from the north point of Babi.

**Rawa island**, about half a mile in extent, lies  $2\frac{1}{4}$  miles north-eastward from North Babi. From Rawa a chain of islets and rocks

*General charts 1355, 2660a.*

*Chart 3543. Var. 1° 20' E.*

extends 3 miles north-westward, terminating in Gurong islet; the islets between are Kalabang, Goal, and Mensirip.

**SIRIBUAT ISLANDS**, situated 7 miles north-north-westward from Gurong, consist of two islands, the eastern and larger being about  $1\frac{1}{2}$  miles in extent.

The western island (*Lat. 2° 42' N., Long. 103° 52' E.*) is 748 feet high, and less than half the extent of the eastern. These islands are connected by a reef, upon which are rocks above and below water. Off the north-east part of the eastern island are the two Santu islets.

The four Mirtang islands, connected by a reef, lie nearly 2 miles southward of the western Siribuat island.

**BLAIR HARBOUR** (*Lat. 2° 40' N., Long. 103° 45' E.*).—**Kaban island**,  $1\frac{1}{2}$  miles in length, and half a mile in breadth, lies near the mainland, abreast the Siribuat islands, and with a prominent point of the coast named Peniabong, about a mile distant, forms Blair harbour, suitable for small craft.

**Rocks.**—About a mile south-eastward of the south entrance of the harbour, lies Gading rock above water with sunken rocks around; rocks also appear to extend from the points on both sides of the south entrance, thus materially contracting the channel. Little Kaban lies about a mile northward of Peniabong point on the edge of the shore reef; other islets and rocks lie within it. North-westward of Kaban is a group of islets and rocks named Tonos, and in the same direction, distant 2 miles from Kaban, is Leiar islet.

A rock which uncovers, with 4 to 5 fathoms around, lies about half a mile south of Leiar islet.

**Water.**—Plenty of fresh water may be procured on Kaban island by digging wells about 30 yards from high-water mark.

**Directions.**—The harbour is safe for small craft, sheltered from the prevailing winds, with anchorage in 4 fathoms, stiff mud. From the northward, it is easy of access by passing between the north point of Kaban and the Tonos rocks, where the depths are 6 and 7 fathoms, decreasing to 5 and 4 fathoms within. From the southward, give a berth to the sunken rock near the south-west point of Kaban.

**GENERAL DIRECTIONS.**—The Sibu or Inner channel, between the Malay coast and the off-lying islands above described, can be used by keeping along the coast at 3 or 4 miles distance. The depths are 8 to 11 fathoms, usually soft ground in mid-channel, with a few casts of sand in some places about midway between Tingi and the mainland.

With a working wind a sailing vessel may borrow towards the mainland, generally to 7 fathoms, and in some places to 6 fathoms; and

*General charts 1355, 2660a.*

*Chart 3543. Var. 1° 20' E.*

stand off to 11, 12, and 13 fathoms, except in Sibu channel towards Sibu islands, where the depths decrease suddenly from 9 or 10 fathoms to 3 fathoms on Sibu island reef; in this portion a vessel should tack, when the water has deepened to 8 fathoms, when standing off-shore. The channel is safe for use during the day, but in the narrow parts, among the islands, it is prudent to anchor at night, because some of the rocks or islets are very little above water.

**Tides.**—It is high water, full and change, about 20 miles southward of the entrance to the Inner channel, at 9h. 44m.; springs rise 7 feet. Near the Siribuat islands it is high water, at 8h. 50m., and springs rise 9 feet.

In fine and moderate weather, tidal streams will generally be found setting along the coast, but currents predominate when the wind blows strong, running to the southward in the north-east monsoon, and in the opposite direction during the south-west monsoon.

**PULO AOR**, and the Tioman islands north-west of it, form the west side of the main fairway up the China sea; between it and Pulo Domar, the westernmost of the Anamba islands, the channel is 53 miles wide, with depths of 27 to 30 fathoms.

Pulo Aor (*Lat. 2° 27' N., Long. 104° 31' E.*) is about 3 miles in length, north-west and south-east, by about  $1\frac{1}{2}$  miles in breadth, thickly wooded and apparently steep-to; it has two peaks, the southern and higher being 1,805 feet in height, and the northern 1,521 feet.

Pulo Aor is generally adopted as a point of departure by vessels bound to China, and steered for on the return passage. Being formed of two hills, it has the appearance of two islands when viewed at a great distance on a north-east or south-west bearing, and resembles a saddle on a nearer approach. The southernmost peak is dome-shaped, and in clear weather may be seen from a distance of 40 to 50 miles. *See view a, on page 56.*

**Pinang** is an islet, covered with trees, lying close off the south-east point of Pulo Aor, and Lang is an islet lying about half a mile from the north-west point.

Dyang island is separated from the north end of Aor by a narrow channel having a depth of about 18 fathoms.

**Anchorage.**—Toh kyah, the bay on the south-west side of the island, affords shelter during the north-east monsoon, when the wind is between North and E.S.E.

A good position is with Lang island in line with the north-west point, in 20 fathoms, sandy bottom, about half a mile off-shore; the bank is steep within a depth of 20 fathoms, and therefore it would be imprudent to shoal under that depth in a large vessel.

*General charts 1355, 2660a.*



*Chart 3543. Var. 1° 20' E.*

**Supplies.**—Pula Aor is inhabited, and there are numerous huts around the bay; firewood and cocoanuts may be procured, but no other supplies, except water. Vessels procure water with their own boats from a small stream on the north shore of the bay.

**Tides.**—There is a rise and fall of tide about 5 or 6 feet, although the current, due to the monsoon, is met with in the offing.

**Pulo Pemangil** lies 12 miles north-westward from Pulo Aor; like that island it has two peaks situated in a north-west and south-east direction from each other, the southern peak being 1,507 feet, and the northern 1,227 feet in height (*see view c, abreast*). The bay on its south-west side is similar to that on the south-west side of Aor, and affords anchorage in a depth of 18 to 19 fathoms, one mile off-shore. No soundings are shown on the charts. There are no supplies.

**PULO TIOMAN.—Aspect.**—This island, situated about 24 miles north-westward from Pulo Aor, is 11 miles in length, north and south, and from 2 to 6 miles in breadth. This island is composed of lofty mountains, the highest of which attains an elevation of 3,444 feet, and may be discerned from 50 to 60 miles in clear weather. *See view b, abreast.*

**Ass's Ears.**—On its south end are two remarkable peaks (*Lat. 2° 44' N., Long. 104° 9' E.*), named, from their aspect, Chula Naga, or Ass's Ears, standing on one base and rising almost perpendicularly from the sea to heights of 2,525 and 2,294 feet.

**Population.—Trade.**—Pulo Tioman forms part of the Federated State of Pahang, and the island is visited by the district magistrate from Pahang river about once a month. The population of the island is about 500, chiefly Malays. A trade in cocoanuts, copra, and sharks' fins is carried on with Singapore; the exports amount to about \$6,000 annually.

*Plan of Joara bay on 1394.*

**Joara bay**, about a mile wide and three-quarters of a mile deep, situated about the middle part of the east side of Pulo Tioman, forms a fairly well-sheltered anchorage during the south-west monsoon, with depths of 6 to 10 fathoms over an even sandy bottom; the most sheltered anchorage is in the south-west part of the bay. Some small islets, 5 to 15 feet in height, lie off the north-east point of the bay to the distance of 1½ cables, close round which the depth is 10 fathoms.

**Landing.—Supplies.**—Many natives reside in huts along the beach, where there are numerous cocoanut trees; elsewhere it is dense, impenetrable jungle. The best landing place is at the mouth of the fresh water stream in the south-west corner of the bay, which can be

*General charts 1355, 2660a.*

Views of Islands eastward of the Malay peninsula.



Pulo Aor bearing  $181^{\circ}$  true, about 28 miles.



Pulo Tioman bearing  $215^{\circ}$  true, distant about 12 miles.



Pulo Pemanyil bearing  $203^{\circ}$  true, about 45 miles.



Pulo Brala bearing about  $215^{\circ}$  true, distant 6 miles.



*Chart 3543. Var. 1° 20' E.*

ascended by a boat at high water for a distance of 2 or 3 cables. A small supply of cocoanuts, bananas, and fowls can be obtained. There is also good landing within the mouth of the northern stream (fresh water) in the south-west monsoon season.

**Mokut and Nipah bays.**—There is a village on the south-east side of the island, in Mokut bay, a small sandy bay, which affords anchorage in 20 to 22 fathoms, sand, and may be used during fine weather; but Nipah bay on the south-west side of the island, affords the best shelter in the north-east monsoon.

If intending to anchor in Nipah bay, when coming from the northward, pass close round the north-west end of Tioman, between it and the small islands, the passage being  $2\frac{1}{2}$  miles wide, with depths of 20 to 24 fathoms. Keeping about  $1\frac{1}{2}$  or 2 miles from the western shore of Tioman, the water will shoal gradually in the bay to 10 or 9 fathoms, sand and gravel; the best berth is in a depth of 15 or 16 fathoms, with the extremes of the bay bearing  $113^\circ$  true and  $339^\circ$  true, and the middle of the sandy bay  $29^\circ$  true.

Tingah bay, on the north-west side of Pulo Tioman, is reported by the natives to be clear of danger.

**Water.**—There are two streams of fresh water in Nipah bay where boats can fill their water casks, but a bar at the entrance of the southern one prevents their going in and out at low water. Firewood may be procured in abundance near the shore. Other supplies are not to be obtained here, the bay seldom being inhabited, although several parts of the island are cultivated.

There is also a stream of fresh water at the south end of Pulo Tioman at the foot of the Asses Ears, and three streams in Joara bay, above mentioned.

**Tides.**—It is high water, full and change, at Tioman, at 6h.; springs rise 7 or 8 feet; along the west side of the island the flood stream sets to the northward, and the ebb to the southward, from one to  $1\frac{1}{2}$  miles per hour at times.

**Islets and rocks near Tioman.**—**Giit islet.**—At 3 miles south of the Asses Ears is Giit islet, having a high rock close southward of it.

**Bara and Burong** are two rocks, or small islets, lying in the fairway of the channel between Tioman and Siribuat islands. Bara lies 6 miles westward of Giit, and has sunken rocks extending nearly half a mile northward of it.

Burong (*Lat.  $2^\circ 47' N.$ , Long.  $103^\circ 56\frac{1}{2}' E.$* ) is distant 10 miles north-westward from Bara, and the same distance westward of Tioman; close to the eastward of Burong are some rocks above water.

*General charts 1355, 2660a.*

*Chart 3543. Var. 1° 20' E.*

**Tolie** is the largest of the islands off the north-west point of Tio-man, from which it is distant nearly 3 miles. This island is about a mile in extent, having rocks above and below water extending about a mile southward of it.

On the western side of Tolie there is a small bay where anchorage may be had in a depth of 10 fathoms, coral and sand; a reef appears to project about 2 cables from the southern point of the bay.

**Chibeh.**—A little more than a mile to the northward of Tolie is Chibeh islet; and from 2 to 3 miles westward of Tolie are Sepoi and Labas islets, with rocks extending a short distance to the eastward of the latter.

**The COAST** from abreast Blair harbour trends westward for 7 miles to Sungi Endau, and thence about north-west to the entrance of Sungi Pontean 9 miles beyond; here it gradually assumes a more northerly direction as far as the entrance of the Pahang river, 47 miles northward of the Pontean.

The coast as far westward as Sungi Pontean is fronted by a shallow bank to the distance of 2 to 3 miles, with Boyah rock, awash, at the latter distance. *See below.*

**Sungi Endau** (*Lat. 2° 40' N., Long. 103° 37' E.*) is fronted by a bar, with a low water depth of about 6 feet, extending apparently  $1\frac{1}{2}$  miles seaward of its entrance points, and by a bank with less than 3 fathoms to about  $2\frac{1}{2}$  miles off-shore. No late information is at hand regarding it.

The average depths for a distance of 34 miles up the river are 5 to 6 fathoms. Both banks of the Endau are thickly wooded, and during the rainy season the right bank is generally submerged.

**Boyah rock.**—Two small islets, named Duchong, lie on the shore bank nearly a mile off the coast and 3 miles southward of Sungi Pontean. About 3 miles eastward of them is Boyah rock, awash, with 4 to 5 fathoms water around, with the entrance of Sungi Pontean bearing 274° true, distant  $5\frac{1}{2}$  miles.

*Plan of entrance to Rumpin river on 1394.*

**Rumpin river** (*Lat. 2° 49' N., Long. 103° 28' E.*) enters the sea about 13 miles north-westward of Sungi Endau. Its entrance is obstructed by a sandbank, with shallow water extending one mile seaward of it.

The channel on the south side of the entrance has low water depths of 7 to 10 feet; springs rise about 8 feet. These depths are not to be relied on, and the bar is not usually passable during the north-east

*General charts 1355, 2660a.*

*Plan of entrance to Rumpin river on 1884.*

monsoon period. Within the river the water is deeper, and a steam launch could ascend to the distance of about 140 miles from its mouth.

A police station is situated within the entrance, on the right bank.

*Chart 3543.*

**Margaret shoal** (*Lat.  $2^{\circ} 58' N.$ , Long.  $103^{\circ} 28' E.$* ).—"The brig *Margaret*, in working to the northward along the coast in January, 1827, shoaled suddenly from 6 to 4 fathoms and then to 3 fathoms, at about 3 miles off-shore, and 9 miles northward of the entrance of Rumpin river. There was a heavy swell on, and the water was breaking at half a cable in-shore of this position. From the depth of 3 fathoms the two conspicuous little hills on the low land, of regular form, bore W. by S., and S.W. by W. (*mag.*), the trees close to the beach being then visible from the deck. Between the shoal and the shore there appeared to be deeper water."

**PULO VARELLA, or BERHALA** (*Lat.  $3^{\circ} 17' N.$ , Long.  $104^{\circ} 39' E.$* ), 92 feet in height, lying 15 or 16 miles from the mainland, is an islet about 300 yards in circumference, with steep sides and covered with trees, and in clear weather may be discerned from a distance of about 15 miles. There is a ledge of rocks about 3 feet high, over which the sea breaks in bad weather,  $3\frac{1}{2}$  cables  $13^{\circ}$  true from Pulo Varella.

**Banks.**—At about 4 miles northward of the island is the west end of a rocky bank with overfalls, which extends thence some 6 miles in an easterly direction, with a breadth of about one mile; the depth upon it appears to be about 5 fathoms throughout; it is steep-to.

A bank with a least-known depth of 6 fathoms, and steep-to, lies with Pulo Varella bearing  $265^{\circ}$  true, distant about 9 miles. There are depths of 13 to 14 fathoms, sand and mud, between it and the islet.

**The channel** between Varella and the mainland is considered safe; for although the bottom is hard sand in some places, the depths are generally regular, about 11 or 12 fathoms near the island, shoaling gradually towards the main. Depths of 6 fathoms, and of 5 fathoms, are charted as existing, respectively,  $270^{\circ}$  true  $7\frac{1}{4}$  miles, and  $289^{\circ}$  true 10 miles from Pulo Varella.

*Plan of Pahang river on 1894.*

**PAHANG RIVER** (*Lat.  $3^{\circ} 32\frac{1}{2}' N.$ , Long.  $103^{\circ} 27\frac{1}{2}' E.$* ), the entrance to which is about 20 miles north-westward of Pulo Varella, was formerly a place of considerable trade.

The river is about half a mile wide between its entrance points. Just within is Pulo Tejah, which divides the river into two channels.

*General charts 3543, 1355, 2414, 2660a.*

*Plan of Pahang river on 1394.*

Above, the river is shallow, and boats drawing 3 feet (except at high water) have difficulty in getting to Pékan, a town of 1,000 inhabitants, about 6 miles from its mouth.

The Sultan resides at Pékan, which is the administrative centre of a large district.

The bar is not now (1911) passable during either monsoon.

**Bar.**—A shallow flat fronts the river mouth to the distance of three-quarters of a mile, over which there is a depth of about 2 feet at low water. This depth is liable to change, and therefore the chart is not to be relied on. Spring tides rise about 8 feet.

**LIGHT.**—A *fixed white* light is exhibited on the north bank of the river, from a wooden tower 33 feet high, at an elevation of 37 feet above high water, visible in clear weather from a distance of 6 miles.

The lighthouse, backed by trees, is difficult to make out by small craft approaching in the afternoon, with the sun shining ahead.

**Flagstaff.**—On the north side of the entrance is a flagstaff, quarters for travellers, and a small village.

**Anchorage.**—There is anchorage outside the bar in a depth of about 6 or 7 fathoms, with the lighthouse bearing  $246^{\circ}$  true, distant about  $1\frac{1}{4}$  miles, usually indicated by a buoy.

**Communication.**—Small steamers run regularly from Singapore to Pahang anchorage, where they load or discharge cargo into surf boats.

**Supplies.**—Poultry and fruit are obtainable.

*Chart 3543, Approaches to Singapore.*

**The COAST** between Pahang river and the Kuantan river, about 18 miles to the northward, forms a bay, which has not been sounded, but the chart shows depths of 8 to 9 fathoms on the line joining the entrances of the rivers. Bukit Galing lies about 4 miles within Tanjong Temiling, the north point of approach to the Kuantan. From this river the coast, off which no soundings are shown, trends north-eastward about 11 miles to Tanjong Gelang, a high and salient point, within which is Bukit and Kampong, Gebing. Telok Berserah affords anchorage in the south-west monsoon period; Berserah, or Beserah, is a large fishing village.

This coast is in general considered safe to approach to depths of 8 or 10 fathoms; but there are frequently overfalls on ridges of uneven bottom lying parallel to the coast; and there are some spots of 6 to 7 fathoms, sand and coral, about 22 miles off-shore, with 10 fathoms nearer the coast, as charted; less water may exist.

*General charts 1355, 2414, 2660a.*

*Plan of Kuantan river entrance on 1394.*

**KUANTAN RIVER** (Lat.  $3^{\circ} 50' N.$ , Long.  $103^{\circ} 20' E.$ ) lies about  $1\frac{1}{4}$  miles within the high point of Tanjong Temiling (Tembiling). Between the river and the point a bank with less than 6 feet water stretches  $1\frac{1}{2}$  miles to the southward, the outer part of which is marked by a group of stakes 4 cables within its extreme, and a buoy, about half a mile south-east of it in about 3 fathoms, not to be depended on.

Southward of the stakes lies the bar, upon which there is a depth of about 6 feet at low water, with a spring rise of about 8 feet. These depths are subject to change, as the bar is of a shifting nature. See night signal below.

Steam vessels of 7 feet draught navigate to Datu Sawa some 15 miles up, a station of the Pahang Corporation. It is the outlet of a considerable tin-mining industry.

There are a few huts on the south point of entrance to the river, and the town of Kuantan is situated on the north bank about a mile within it. The town is the administrative centre of a large district. Vessels can obtain water at the wharf from the town pipes.

**Communication.**—Small steamers run regularly from Singapore to the Kuantan river, calling at Pahang anchorage.

**Lights.—Beacons.**—Two pairs of beacons, all painted white, mark the entrance channel to Kuantan river, the front beacon in each case being square, and the back (at a greater elevation) rectangular in shape. The outer marks, about 120 yards apart, 17 and 34 feet in height, are situated (front mark)  $7\frac{2}{10}$  cables,  $207^{\circ}$  true, from the observation spot at the river entrance, and were in line (December, 1911) when bearing  $324^{\circ}$  true, leading in the fairway south of the red light on the dolphin marking the spit. The inner marks (21 and 37 feet above high water), situated within the river at  $2\frac{7}{10}$  cables,  $317^{\circ}$  true, from the observation spot, when in line bearing  $347^{\circ}$  true, lead up the channel within the bar between the banks.

At night a *fixed white* light is exhibited on each of these marks, said to be visible about 9 miles. The lights are exhibited all the year round, and the beacons are moved as the channel changes.

A dolphin marks the south extreme of the spit forming the eastern side of the channel, at the distance of  $16\frac{2}{10}$  cables,  $165^{\circ}$  true, from the observation spot. A red Wigham light is shown from it, visible 2 miles.

**Bar depth signals.**—By day, the depth on the bar is shown by balls hoisted on a staff near the lights in the river entrance.

A white ball indicates 8 feet of water or under.

A black ball with a white band,  $8\frac{1}{2}$  feet.

A red ball indicates 10 feet.

A white ball, 11 feet and over.

At night, a *white* light indicates a depth of 8 feet or less; *green*, 8 to 9 feet; *red*, 9 to 10 feet; *white*, 10 to 11 feet.

**Caution.**—It will be observed that the day and night signals for a depth of 8 feet or less are the same as for 10 to 11 feet. No one should enter the river without local knowledge.

*General charts 1355, 2414, 2660a.*



*Chart 3543, Approach to Singapore. Var. 1° 30' E.*

**COAST.**—From Tanjong Gelang (page 60), the coast trends northward for 23 miles to Tanjong Panunyt or Penimjoh. Southward of Tanjong Gliga besar, which lies about midway between, no soundings have been taken.

**Bukit Tenga** (*Lat. 4° 6½' N., Long. 103° 26' E.*) lies 3 miles southward of Gliga besar.

**Sungi Kumama**, about 3 miles northward of Tanjong Gliga besar, has some trade; vessels drawing 8 feet water enter the river.

**Tanjong Panunyt** (*Lat. 4° 20' N., Long. 103° 30' E.*), formerly known as Cape South, is situated 9 miles northward of Sungi Kumama, with several coves between, off which there are depths apparently of 5 to 6 fathoms at a short distance. A rocky islet lies close to the point, and Kecha village is situated within and north-westward of the point.

**Howard shoal** (*Lat. 4° 15½' N., Long. 103° 31' E.*), reported by the ship *Janet Hutton*, in 1823, with a depth of 2½ fathoms, rocky bottom, lies about 6½ miles 146° true from Tanjong Panunyt; less water may exist, as the Malay fishermen stated there was only one fathom on its centre. Its position, as charted, is doubtful; there are no soundings shown around it.

**Tanjong Dungun.**—The coast from Tanjong Panunyt trends northward for about 27 miles to a rocky point known as Tanjong Dungun, forming three bays, separated by Tanjong Laboha and Tanjong Pelor or Packa, the hills within which are 1,176 and 1,700 feet in height, respectively; a stream discharges close southward of Laboha, and another the Sungi Packa in the bay within and southward of Tanjong Packa.

The Sungi Dungun lies close southward of Tanjong Dungun. The points of these bays are rocky, but there are depths of 8 to 10 fathoms at from 2 to 3 miles off-shore.

There are several villages in the southern bay, that of Karte being at the north end. Packa village lies within Tanjong Pelor or Packa.

**Shoal.**—A shoal, having over it a depth of 3 fathoms, was reported in 1907 by native fishermen to be situated about 3 miles north-eastward of Tanjong Dungun. This shoal is charted as P.D.

**Sungi Dungun.**—The entrance to this river is obstructed by a sandbank, drying at low water, which extends from a position half a mile outside the southern entrance point in a north-north-east direction to within 2 cables of the northern bank.

The channel runs close to the northern bank until a small sandy cove is reached, when the depth increases to 3 fathoms.

**Village.**—The village of Dungun is situated on the left bank of the river, at about half a mile within the entrance.

**Supplies.**—Goats, fowls, fruit, rice, and fish can be obtained, and there is a good supply of fresh water.

*General charts 1355, 2414, 2660a.*

*Chart 3543, Approaches to Singapore. Var. 1° 30' E.*

A small trade is carried on in dried fish and copra; tin is exported to Singapore in small quantities.

**Pulo Brala** (*Lat. 4° 49½' N., Long. 104° 41½' E.*), distant about 15 miles eastward of Tanjong Dungun, is about 1½ miles in length, and 930 feet in height, and may be seen about 30 miles off in clear weather; when it bears about 180° true its summit appears flat, but in hummocks when bearing to the south-west and westward. A black rock or islet lies one mile southward from its southern extreme. Also an islet about 3 cables in length lies about 2 miles 339° true of the island, with three islets or rocks about a mile beyond; they are all apparently steep-to. *See view d* of the island, on page 56.

Between this island and the mainland the depths are irregular in some places, and the bottom rocky, or sandy; but in other places regular depths of 15 to 19 fathoms. are found over a bottom of mud.

**The coast** northward of Pulo Brala is continued on page 116, with the Gulf of Siam.

#### ANAMBA ISLANDS.

*Charts 2244, 1371, Anamba islands.*

**GENERAL REMARKS.**—The Anamba islands lie on the eastern side of the main route up the China sea, Pulo Aor and the Tioman islands forming the western side. The light on Pulo Manki (page 70), at the north-west extreme of the Anambas, is now a valuable aid to night navigation.

The Natunas, north-eastward of the Anambas, lie somewhat out of the track up the China sea, and are described in Vol. IV., with the Paláwan route. North Natuna, the nearest to the main track, is also described in this volume (page 89).

The survey and directions for the Anamba islands are by Commander A. M. Field and the Officers of H.M.S. *Egeria*, 1893, amended to date.

These islands, the higher peaks of which are from 1,200 to 1,800 feet in height, and thickly clothed with dense forest to the very summits, consist of two large groups and several smaller ones, with numerous detached islets. Many of the islands are inhabited, and the great abundance of cocoanut plantations is a very noticeable feature all over the group.

The export of cocoanuts in the form of copra forms the staple trade of the islands, which is carried on by means of small sailing schooners plying to Singapore and to Linga. Sago also is exported.

*General charts 3543 and 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

The natives everywhere appear to be perfectly harmless and peaceable, and well disposed towards strangers.

**Protectorate.** — The islands form part of the seven groups known to the natives as the Tuju islands, and lying between the parallels of 0° and 5° N., and the meridians of 105° 20' and 109° 20' E., which includes the Anambas. The whole belong to the Sultan of Linga, are under the protection of the Dutch, and form part of the Rajahship of Rhio-Linga.

The principal village is Terempah (*Lat. 3° 13' N., Long. 106° 13' E.*) on the north coast of Siantan island. The Dutch Government official resides here, and is in charge of the north-eastern group. The population of this section is estimated at 4,500 Malays and 500 Chinamen. The south-western groups and off-lying islands are more thinly populated, the inhabitants being estimated at about 2,000.

The principal village of the western group is Kampong Kwala, situated at the head of Telok Kwala, on the east coast of Jimaya island.

**Supplies.**—Bananas, pine-apples, mangoes, betel-nuts, &c., are cultivated in the various islands, but not to any great extent. Goats, fowls, and water can be obtained at the larger villages. A large quantity of fish is caught by the Malays, both by traps and lines.

**Caution.—Channels.**—Although the survey failed to discover any dangers in many of the passages between the islands of a group, yet it was not of a sufficiently exhaustive character to justify vessels in attempting any such passages, and as a rule it is only the channels between the groups that should be made use of.

**Floating islands,** composed of grass, small trees, and other debris from the rivers are sometimes met with in the neighbourhood of the Anambas. One was met with in 1911, reported to be about 50 feet long, and from 10 to 20 feet high.

They are probably seen off the coast of Borneo at times.

**Tides.**—It is high water, full and change, in Selat Pananting (north-east group) at 10h. 0m.; springs rise 7½ feet, neaps rise 4 feet. In Impul passage (Western group) it is high water, full and change, at 9h. 0m.; springs rise 6 feet, neaps rise 3½ feet. The remarks here apply particularly to the months of from June to October, inclusive, the time occupied in the survey.

The moon's declination has a great effect on the tides.

With a high declination N. or S. there is but one high water in 24 hours and one low water; with a low declination there are the ordinary two tides for a few days only. The times of high water of the single tides appear to follow the inferior transit of the moon

*General charts 3543, 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

when in north declination, and to follow the superior transit when in southern declination.

The single tides always appear to rise higher than the ordinary double tides, whether they occur at neaps or at springs. The phenomenon of two tides in the 24 hours will be most apparent when the time of full and change coincides approximately with the time of the moon having a low declination, and they may then occur for 5 or 6 days; under other circumstances they will occur for 2 or 3 days only.

**Tidal streams.**—During the stay of the *Egeria*, in the months of June, July, and part of October, the direction of the tidal stream was as follows:—

The southerly stream began to run from 3 to 4 hours before high water, and the northerly (or ebb) stream commenced at from 3 to 4 hours after high water, but this was subject to an uncertainty of as much as 2 or 3 hours either way. The southerly stream usually ran for 13 or 14 hours, and the northerly stream for 10 or 11 hours.

At springs the tidal streams ran from one to 2 knots per hour.

At neaps they were weak and irregular.

**Winds and weather.**—During the month of June, southerly and south-westerly winds predominated, although occasionally northerly and north-easterly winds were experienced. Rain occurred on several days, but was neither heavy nor continuous.

In July considerably more rain fell and for longer periods. The winds were almost entirely confined to southerly and south-westerly directions.

In August the rainfall began to diminish, the winds still remaining southerly and south-westerly. Sharp and sudden squalls from the westward were occasionally experienced at night during this month, accompanied by rain.

In September very little rain fell, and it was altogether the finest month experienced by the *Egeria* in the Anambas. The southerly and south-westerly winds were more persistent and constant in direction than ever, occasionally blowing fresh from the southward.

In October the rainfall began to increase again, and the prevailing south and south-westerly winds were occasionally interrupted by easterly and north-westerly winds.

During the whole of the stay of the *Egeria* in the Anamba islands from June to October, the amount of cloudy weather and almost entire absence of sunshine for days together, was a marked feature.

The strength of the wind never exceeded a fresh breeze (force 5), and attained that not frequently.

*General charts 3543, 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

The number of hours' rain in June amounted to 23, falling on 22 days; in July, 46, falling on 23 days; August, 28, falling on 23 days; September, 6, falling on 20 days; and October, 27, falling on 28 days.

The maximum barometric reading was 30·08 inches, and the minimum 29·84 inches. Maximum heat, 82°, minimum, 76·5°. Temperature of sea water, 81·6° to 84·6°.

*Chart 1371, Anamba islands.*

**The WESTERN GROUP** is comprised between White rock, the most southern islet of the group, and the parallel of about 3° 20' N.; and between Pulo Riabu, Pulo Buan, and Pulo Durai on the east and north-east, and Pulo Domar on the west.

*Chart 3543.*

**OUTLYING ISLAND.—Pulo Domar** (*Lat. 2° 44½' N., Long. 105° 23' E.*) lies about 21½ miles westward of the south extreme of Jimaya, the largest island of the western group, described below. It is a barren rock, with its summit 270 feet above high water, and with depths of from 30 to 32 fathoms close around. There is a small indentation both on its north-east and south-west sides where landing can be effected in fine weather. There is a little scanty vegetation near the top of the islet.

The bold cliffs show white from the guano deposited on them.

*Chart 1371.*

**JIMAYA (Jimaja) GROUP.**—Jimaya is the principal and by far the largest island of the western group. It is 15 miles in length, 8 miles in extreme breadth, but of irregular shape, and in two places is little more than one mile across. It is densely wooded and mountainous, attaining a height of 1,530 feet at its north-east end; the peaks on the northern part of the island are for the most part easily distinguishable, but towards the southern end they become more uniform in outline.

The north point has a reef extending 4 cables off, on which are several rocks above water.

**Villages.**—There are several large villages on the coast, principally on the northern part of the island.

**West coast.—Tanjong Julian.—Pulo Ipann**, an islet 80 feet in height, cultivated with cocoanut trees, lies a quarter of a mile westward from Tanjong Julian, on the north-west coast of Jimaya, and is steep-to. The coast northward is fringed with reef, but has no off-lying dangers.

**Courier patch**, with a depth of 6 fathoms, lies south-west, distant 1½ miles from Tanjong Julian, with depths of 16 to 20 fathoms around.

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

It is stated that in 1839 the *Courier* struck on a rock about 3 miles 221° true from Tanjong Julian. The ground in this vicinity was carefully searched by the boats of H.M.S. *Egeria* during three days, but with the exception of the 6-fathoms patch above mentioned, no other shoal could be detected, and nothing less than that depth was obtained.

**Pulo Sibrong** is a wooded island,  $1\frac{1}{2}$  miles in length, with two prominent peaks, the southern one being 580 feet in height. The bay within is too much encumbered with reef for a vessel to enter. There is a village at the head of this bay.

**Pulo Tulai**, 365 feet high, lies between Julian point and Pulo Sibrong, but a reef extends 2 cables from its southern half.

**Anchorage.**—There is anchorage in a depth of 8 fathoms, sand, at a quarter of a mile north-eastward of Pulo Tulai, but it is not advisable to go further into the bay.

**Gunong Datu** and **Gunong Adong**, 1,480 feet and 1,420 feet high, respectively, are two prominent peaks on the north part of Jimaya. The former shows as a remarkably sharp peak from nearly all views, the latter shows as a rounded hill from the eastward or westward, but is sharp from the northward.

**Pulo Daru** (*Lat. 2° 55' N., Long. 105° 41' E.*), a wooded island 635 feet high, lies close to Jimaya. A small islet, Pulo Katukan, lies a quarter of a mile to the westward of it, with a narrow boat channel between.

**Margesson shoal**, of sand and coral, is about  $1\frac{1}{2}$  miles in length, and consists of two portions; the northern one has a least depth of 7 fathoms, and the southern a depth of 5 fathoms. From the latter, Tanjong Jibang bears 110° true, distant  $7\frac{3}{4}$  miles. This shoal has depths of 22 to 28 fathoms around, and is usually marked by tide-rips.

**Tanjong Jibang** is the southern extreme of Jimaya; the hills slope gradually down to the point; a flat rock, 20 feet high, lies about 3 cables south-east of it.

**East coast.**—**Telok Neratu** (*Lat. 2° 52' N., Long. 105° 47' E.*) is a bay, the entrance of which is  $3\frac{3}{4}$  miles across between Pulo Dayong and Tanjong Linang. The southern portion of this bay is an inlet about 3 miles in length, but is so encumbered with reefs that a vessel cannot make use of it. In the northern portion of the bay is Pulo Ponissan (Punisan), 400 feet high; the space within it is blocked with reefs. A detached reef lies two-thirds of a mile southward of Pulo Ponissan, and within this also reefs encumber the bay.

A patch of 2 fathoms lies three-quarters of a mile north of Pulo

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

Dayong, and this marks the western limit to which a vessel may safely enter the southern portion of Telok Neratu.

**Anchorage.**—There is anchorage in a depth of 14 fathoms, mud, midway between Pulo Ponissan and Pulo Dayong, with the north end of the latter bearing 216° true, distant one mile.

**Telok Kwala**, situated close northward of Tanjong Linang, is a narrow inlet 2 miles in length. A rocky bar, with a depth of 3 fathoms, stretches right across, three-quarters of a mile within the entrance. Within this bar there are depths of 6 fathoms gradually shoaling towards the head of the inlet, with two detached coral patches obstructing it. The large village Kampong Kwala lies near the head of the inlet on the northern shore; it is the principal village of the island, and much frequented by the sailing schooners collecting produce.

**Anchorage.**—There is anchorage off the entrance, northward of Tanjong Linang, in a depth of 12 to 14 fathoms, sand.

In the bay northward of Telok Kwala there is anchorage anywhere near the centre in 9 to 10 fathoms, sand, about three-quarters of a mile from the shore, which is fringed with reef extending from one cable to half a mile in places.

**Gunong Tujoh**, densely wooded, double peaked, and 1,530 feet in height, is the highest and most prominent mountain in the island, and is conspicuous from every direction.

**Tanjong Penanang (Pinanang)**, the north-eastern extreme of Jimaya, is low, and lies 2 miles northward of the north point of the bay before mentioned. Off the coast between there is an islet cultivated with cocoanut trees, close to the southward, of which there is a detached reef, which projects beyond the line of the points.

**Pulo Penanang (Pinanang)** (*Lat. 3° 1' N., Long. 105° 50' E.*), situated 1½ miles north-westward from the point of the same name, is 270 feet high, and planted with cocoanut trees.

**Pulo Ayam**, with two peaks each 500 feet in height, lies 2¼ miles westward of Tanjong Penanang, close to the coast of Jimaya, and is connected with it by a reef.

**Telok Mampoh (Mampo)** is a large bay on the north coast of Jimaya. It is 4½ miles wide between Pulo Ayam and Tanjong Minagar, and 3½ miles deep to its head, where there is a long stretch of sandy beach and several villages. The general depths in this bay are 13 to 15 fathoms over a sand and gravel bottom in the outer part, gradually shoaling to 7 and 8 fathoms at one mile from the sandy beach at the head. There is a conspicuous hill, Gunong Silvassi, 840 feet high,

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

close to the coast, at the eastern end of the sandy beach, and another conspicuous hill, Gunong Puding, 700 feet high, at the head of the bay near the western end of the beach.

**Reefs.—Anchorage.**—The western shore of Telok Mampoh is foul within a mile of the coast, and there is a coral patch of 3 fathoms, with Gunong Silvassi bearing 145° true, distant a little over one mile. At the head of the bay also there are detached patches of reef within half a mile of the beach; with these exceptions the bay appears to be clear of dangers, and suitable for anchorage in any part at a convenient distance from the shore.

**Pulo Gumbong and Pulo Udan** are two islets on the same reef in the north-west part of Telok Mampoh, lying close together, of which the eastern one, Pulo Gumbong, 320 feet in height, is the higher.

**Tanjong Mingar.**—The north point of Telok Mampoh is a promontory 350 feet high, and appears from a distance as an island, being joined to the mainland by a low sandy neck.

**Anchorage.**—Westward of Tanjong Mingar the coast forms a bay 1½ miles deep and three-quarters of a mile wide, affording convenient anchorage in a depth of 16 fathoms, sand, with Tanjong Mingar bearing 92° true, distant one mile, out of the influence of the tidal streams which set somewhat strongly through Impul passage. There is a patch of 4 fathoms half a mile westward from Tanjong Mingar.

The head of the bay is foul, and also the western side, where there are some detached coral patches extending a quarter of a mile from the shore. The edge of the reef on the eastern side is, however, steep, and by keeping over on that side, the bay may be entered to within a mile of its head, where there is from 12 to 13 fathoms water.

**PULO IMPUL** (*Lat. 3° 5' N., Long. 105° 43' E.*) is the highest and easternmost of a group of islands extending 9 miles in an east and west direction, at one mile northward of Jimaya. It is 2½ miles in length, with an extreme breadth of 1½ miles. The sharp and conspicuous wooded summit lies near its centre, and is 1,180 feet in height. In the bight, on the south-east side of the island, is an islet 130 feet high, surrounded by reef, and about 2 cables southward of the islet there is a reef of rocks just awash at high water.

**Pulo Ania (Aniak)**, 640 feet high, north-west of Pulo Impul, is separated from it by a channel 2 cables broad, with depths of 7 fathoms. Two islets, 180 feet and 205 feet high, lie, respectively,

*General charts 3543 and 2660a.*



*Chart 1371, Anamba islands. Var. 1° 30' E.*

half a mile north-west and northward from Pulo Ania; the western is fringed by reef.

**Pulo Moburi (Mubur)** is separated from Pulo Ania by a channel half a mile wide. The island is  $2\frac{1}{2}$  miles in length, and joined by a mangrove swamp (through which there is a canoe passage) to Pulo Kramat on its south-west side. A ridge of rounded hills lies on the north side of Pulo Moburi, the highest of which is 810 feet in height. The bay on the southern coast of Pulo Moburi is encumbered with foul ground, and does not afford convenient anchorage.

**Pulo Datu** is 350 feet high, and lies close to the south-east extreme of Pulo Moburi.

**Pulo Manki (Mangkai)**, the westernmost island of the group, lies 2 miles from Pulo Kramat, with a deep and clear passage between. It is  $1\frac{1}{2}$  miles in length by half a mile in breadth, 575 feet high, and wooded, and almost of a uniform height throughout.

Manki kechil, 200 feet in height, lies close southward of the east point of Pulo Manki. The coasts of Pulo Manki and Manki kechil are fairly steep-to.

**LIGHT.**—Near the centre of Pulo Manki, from an iron tower, 82 feet in height, is exhibited at an elevation of 636 feet above high water, a *flashing white light every five seconds*, visible 33 miles in clear weather. It is obscured eastward by the higher islands, but is visible in Impul passage.

**IMPUL PASSAGE**, between Pulo Impul and Jimaya, is one mile wide in its narrowest part, and clear of dangers; the shores on either side are steep. There is a patch of 9 fathoms in the fairway, and the shoals below mentioned.

The flood stream sets to the westward, and the ebb to the eastward at about  $1\frac{1}{2}$  knots at springs.

**Bunker patch** is a coral head of 5 fathoms, on a 10-fathoms bank, situated on the north side of the east entrance to Impul passage, at  $1\frac{3}{10}$  miles  $16^\circ$  true from Tanjong Mingar. The whole of Pulo Manki kept open southward of Pulo Impul, leads southward of Bunker patch.

**McCaulay patch** is a small coral patch of 5 fathoms, and possibly less, water, with 20 to 27 fathoms around, in the western approach to Impul passage. It lies  $1\frac{1}{2}$  miles  $280^\circ$  true from the end of the low black rocks off the north point of Jimaya.

**Clearing marks.**—Telaga summit in line with the south extreme of Pulo Impul, bearing  $92^\circ$  true, leads  $2\frac{1}{2}$  cables northward of McCaulay patch. The south-east extreme of Pulo Impul in line with the end

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

of the black rocks off Jimaya, 69° true, leads 7 cables southward of McCaulay patch, and Pulo Katukan, open eastward of Pulo Ipann, 180° true, leads eastward of the patch.

**White rock** (Tokong Malangbaru) (*Lat. 2° 18' N., Long. 105° 36' E.*), the south-westernmost of the group, lies about 32 miles southward of Jimaya. It is a white, flat-topped barren rock, 110 feet high, and 150 yards in length, with steep cliffs at its eastern end. The rock is steep to all round, except close to the western extremity, where the shallow water extends off for a short distance.

**Pulo Repon**, situated 17 miles 77° true of White rock, is 685 feet high, wooded, and about half a mile in extent. It has two peaks joined by a high saddle, the eastern summit being the higher, and is surrounded by a narrow fringe of reef, the edge of which is steep.

**Pulo Baua** is a small cluster of uninhabited islets and rocks extending  $1\frac{1}{2}$  miles in a north and south direction, the whole being surrounded by a reef and lying 13 miles north-eastward of Pulo Repon. The largest and northern islet has a wooded summit 440 feet in height, and close to the northward of it there is a pyramidal-shaped rock, 220 feet in height.

The southern islet is 410 feet in height. The edge of its reef extends south-eastward to a distance of 3 cables. Between the two principal islets there are a few low bushy islets and rocks standing on the edge of the reef connecting them; the group rises from depths of 35 to 45 fathoms.

**Pulo Rittan** (*Lat. 2° 37' N., Long. 106° 17' E.*) is another small uninhabited group of three islands, extending  $2\frac{1}{2}$  miles in a north-east and south-west direction, situated  $14\frac{1}{2}$  miles east-north-eastward from Pulo Baua.

The southern island is one mile in length, 450 feet in height, near the southern end, and thickly wooded, with an islet close eastward of its northern extreme. Both stand on the same fringing reef which projects on the eastern and southern sides to a distance of 2 cables.

Separated from these islands by a channel one mile wide, is the north-eastern islet of the group, 200 feet in height, situated on a reef that extends to the north eastward and westward for 4 cables; a flat rock, about 30 feet high, marks the western extremity of the reef.

The channel between the islets appeared to be clear, but it was not examined in any detail.

**Tide-rips.**—Southward of Pulo Rittan tide-rips and overfalls were observed with all the appearance of shoal water, but examination merely showed a slightly uneven bottom, and nothing suspicious could be detected by the lead.

*General chart 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

**Brownrigg rock**, with a depth of 2 fathoms, is a coral patch lying 80° true nearly one mile from the north-eastern islet of the Pulo Rittan group. There are generally tide-rips over the patch.

**Pulo Riabu (Ayer Abu).**—The Riabu group lies between 5 and 12 miles north-north-westward from the Rittan group. The principal island, Pulo Riabu, is 6 miles in length, with an average breadth of  $1\frac{1}{2}$  miles.

A high wooded ridge, with several prominent peaks on it, traverses the island. The highest peak, near the north-western end, is 1,595 feet in height, showing sharp from all directions.

The other prominent peak, 1,580 feet high, is near the centre of the island and is flat-topped.

The eastern coast has several small deep-water bays; on the west coast there is a bay over one mile in extent, in the centre of which there is anchorage in a depth of 12 to 15 fathoms, mud; the head of the bay is foul.

A reef extends half a mile in a north-westerly direction from the southern point of this bay, and has an islet on it.

South-eastward of Pulo Riabu, and separated from it by a boat-channel, is an island having a sharp wooded summit, 610 feet high. The only natives that were seen in the Riabu group inhabit a village on the northern coast of this island.

Extending  $1\frac{1}{2}$  miles eastward and north-eastward of the above-mentioned island, there is a group of six small islets from 180 to 220 feet in height; the passages between them should not be attempted. A coral patch of 3 fathoms lies one mile 279° true from the northernmost of these islets. A reef awash, lies one quarter of a mile from the north point of the bay in Pulo Riabu, north-westward of these islets.

**White rock.**—The flat white rock, 45 feet high, situated three-quarters of a mile 193° true from the south-eastern islet of the Riabu group, has a patch of foul ground a quarter of a mile to the northward of it, and a reef awash at half a mile 248° true from it.

**Pulo Piling**, 1,065 feet high, and densely wooded, with a sharp and prominent summit, lies to the westward of Pulo Riabu, and is separated from it by a channel nearly three-quarters of a mile wide.

A reef awash lies 4 cables from the centre of the north coast.

**Pulo Sra (Sura)** (*Lat. 2° 47' N., Long. 106° 1' E.*), a wooded islet, half a mile in extent and 405 feet high, lies about  $10\frac{1}{2}$  miles westward of the north end of Pulo Riabu. It is surrounded by a narrow fringe of reef, which is steep close to its edge, except on the north and south-east sides, where shallow water extends off about one cable. Also on chart 3543.

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands.*

**Tokong**, a small islet, steep-to all round, 100 feet high, and covered with trees, lies 2 miles north-north-westward from Pulo Riabu.

**Mæander rock**, about 3 cables in extent, with a least depth of about one fathom, on which the sea occasionally breaks, surrounded by depths of 20 to 24 fathoms, lies with Tokong bearing  $27^{\circ}$  true, distant  $1\frac{3}{4}$  miles.

**Pulo Genting**, a wooded islet, 315 feet in height, lying  $4\frac{1}{4}$  miles west-north-westward from the north point of Pulo Riabu, is half a mile in length, with two rounded peaks on its eastern part. The north-west end of the islet is low, with a reef extending from it to the distance of 3 cables.

**Pulo Mantanio (Antaniu)**, a wooded islet, half a mile in extent, and 325 feet high, lies  $1\frac{1}{2}$  miles north-west of Pulo Genting. (*Chart 1371.*)

A reef extends eastward from it for half a mile, with a rock 6 feet in height near its northern edge.

**PULO TEMIAN (Temiang) and Pulo Pentebawa**, forming, with other islets and rocks, a group of  $3\frac{1}{2}$  miles in length, lie  $3\frac{1}{2}$  miles north-eastward from Pulo Mantanio. The first-named island is  $2\frac{1}{4}$  miles in length, with a breadth of over half a mile. It is low in the centre, rising to a broad-topped flat hill at either end; the westernmost and the higher being 860 feet in height and densely wooded. There are inhabitants on the north-east side of the island.

Pulo Pentebawa is a flat islet 100 feet high, lying three-quarters of a mile south-east from Temian, and stands on a reef that projects south-eastward 4 cables from it, on the extremity of which is a small button-shaped islet, 85 feet high.

There is a small detached reef one-third of a mile  $212^{\circ}$  true from the small 85-feet islet.

A flat island, 130 feet in height, similar in appearance to Pentebawa, lies half a mile south-west from that islet. At one mile westward of this flat island is another islet 145 feet high, with a tongue of reef projecting 2 cables westward of it.

The channel between Pulo Mantanio and the Temian group has depths of 26 to 34 fathoms, and is clear of danger.

**PULO TAMBIN (Tambing) and Pulo Ujong**, situated about 2 miles north-eastward of Pulo Temian, lie half a mile apart, with a narrow channel between; they are each about one mile in extent, 525 and 505 feet high, respectively, and wooded. Both islands are inhabited. The channel between them and Temian is quite

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

clear, with depths of 30 to 34 fathoms. Reef extends from the southern and northern points of Ujong to a distance of about 3 cables.

**Pulo Teliban (Telibang)** (*Lat. 2° 59' N., Long. 106° 9' E.*), nearly 2 miles in length, by two-thirds of a mile in breadth, is wooded; its summit, 610 feet high, is near the northern end. It is separated from Pulo Tambin by a channel one mile wide.

**Pulo Dekar**, an islet half a mile in extent, and 350 feet high, lies half a mile westward of Teliban. It stands on an irregular-shaped reef which extends 4 cables westward and nearly one mile northward, in patches, leaving a boat channel between it and Teliban. On the western side of this reef there are detached patches of reef.

A coral patch of 5 fathoms lies three-quarters of a mile 311° true, and another patch, of 3 fathoms,  $1\frac{1}{10}$  miles 13° true from Pulo Dekar.

(*Chart 1371.*)

**PULO BUAN**, a wooded islet 250 feet high, and one mile in length, lies  $3\frac{3}{4}$  miles north-eastward of Pulo Ujong.

A reef extends 4 cables southward of the islet, with a rock on it 14 feet high.

**Pascoe rock** has a depth of 3 fathoms, with 23 to 25 fathoms all around. It lies 2 miles 80° true from the north point of Pulo Buan.

**Pulo Telinjan** is a wooded islet half a mile in length, and 285 feet high. It lies  $2\frac{1}{2}$  miles north-westward from Pulo Buan.

**Bennet rock**, with a depth of 2 fathoms, lies  $8\frac{1}{2}$  cables 94° true from the south point of Pulo Telinjan. There is a patch of 5 fathoms (or probably less water) 63° true, distant  $1\frac{1}{3}$  miles from the same point, and another with 7 fathoms lying 249° true, distant three-quarters of a mile from the same point.

*Chart 1371.*

**Genting Uniot (Uniut)** is the westernmost and largest island of a group of six, situated from 6 to 9 miles north-westward of Pulo Telinjan. It is 2 miles in length, with a bay penetrating half a mile on its west side, in the centre of which there is a depth of 15 fathoms.

A ridge of wooded hills runs throughout the island, culminating in a summit 950 feet high, near the southern end. The coasts of the island have but little reef round them, except at the northern extremity, off which it extends nearly one-third of a mile, with a rock about 5 feet high near its outer end.

**Pulo Semessa**, a wooded islet, 450 feet high, lies between Genting Uniot and Pulo Lingai, and is connected with the latter by a reef.

**Pulo Lingai** is  $1\frac{1}{2}$  miles in length, and pear-shaped. A ridge of

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

wooded hills rises to a summit 950 feet high towards the southern end.

**Pulo Moso**, an islet half a mile in extent, and 395 feet high, lies close southward of Pulo Lingai, and is connected with it by a reef.

*Charts 2244, 1371.*

**Pulo Nauan**, a wooded islet, 270 feet in height, is the eastern islet of the group. Shallow water extends westward from this islet nearly half way to Pulo Lingai.

**Batu Karang Sinki** is a dangerous sand and coral patch, three-quarters of a mile in length, in a north and south direction, with a rock awash near its centre, and depths of 2 to 3 fathoms over other parts. From the rock awash, the eastern extreme of Pulo Nauan bears 193° true, distant  $1\frac{1}{2}$  miles.

**Barnes patch**, of sand and coral, with a depth of 7 fathoms, is situated 2 miles 159° true from the eastern extreme of Pulo Nauan. It forms the north-west end of a bank with general depths of 17 to 18 fathoms, extending north-westward almost continuously from Pulo Telinjan. There is a patch of 10 fathoms, three-quarters of a mile south-east from Barnes patch on the same bank.

*Chart 1371, Anamba islands. Var. 1° 30' E.*

**PULO TELAGA** (*Lat. 3° 4' N., Long. 105° 59' E.*) is the principal island of a group 5 miles in length, lying nearly midway between Jimaya and Genting Uniot. Pulo Telaga is the easternmost island, and is 4 miles in length, by about a mile in breadth. A conspicuous conical peak, 1,740 feet in height, is situated near the northern end, and a high ridge of hills runs the whole length of the island, which is densely wooded. Foul ground extends one-third of a mile from its southern points. The island is inhabited, the villages being principally on the western side.

**Pulo Lima** (*Lat. 3° 6' N., Long. 105° 57½' E.*), the northern island of the Telaga group, is 475 feet in height; Pulo Midai lies between it and Telaga. Pulo Passu, 250 feet high, lies close northward of Midai, and is joined to it by a sandy neck dry at low water. Between Pulo Midai and Telaga there is a passage with depths of 15 fathoms.

**Telaga kechil**, close southward of Pulo Lima, has a sharp summit, 585 feet in height.

**Pulo Buton**, a narrow inhabited islet, cultivated with cocoanut trees, is  $1\frac{1}{2}$  miles in length, and lies two-thirds of a mile westward of

*General charts 3543 and 2660a.*

*Chart 1371, Anamba islands. Var. 1° 30' E.*

the southern part of Telaga. A reef extends off the northern point for two-thirds of a mile, with Pulo Dinkor, a rock, on it. Midway between this reef and the reef extending southward from Telaga kechil there is a reef half a mile in extent, having a passage to the southward of it a quarter of a mile wide leading to an indifferent anchorage in 17 to 18 fathoms water westward of Telaga. This anchorage was not closely examined, but appears to be clear of danger. There is another channel leading to this anchorage from the southward between Pulo Buton and Telaga, but in view of the small scale on which the survey was done, it is not prudent to attempt the narrow channels between the islets of a group.

**Tokong Blinao (Blinau)** is a rock 6 feet high, with foul ground extending to the north, east, and south of it to a distance of nearly half a mile; it lies with the west extreme of Pulo Lima bearing 64° true, distant 3 miles.

**PULO DURAI** (*Lat. 3° 20' N., Long. 106° 3' E.*) is a wooded uninhabited island half a mile in extent, with two sharp peaks 500 feet high, and lies 13° true, distant 15 miles from Telaga. Half a mile westward of the island is Batu Mamong, a rock 5 feet high. There are depths of 30 to 40 fathoms around the island.

**Tokong Nannas (Nanas)** is a bare rock 70 feet high, situated 5½ miles 269° true from Durai. A narrow bank, with a least depth of 6 fathoms, coral, steep-to, extends for nearly a mile west-south-westward from the rock.

*Charts 2244, 1371, Anamba islands.*

**The NORTH-EASTERN GROUP** of the Anamba islands, situated between the parallels of 2° 58' N. and 3° 30' N., consists of three large islands with numerous small islands and islets to the east and south-eastward of them.

**Pulo Pahat** (*Lat. 3° 24' N., Long. 106° 9' E.*), the north-westernmost islet of this group, is pear-shaped. Its flat wooded summit, 700 feet high, lies at the northern end. Reef projects from the south-east side about a quarter of a mile. It is surrounded by depths of 36 fathoms within half a mile all round.

**MOBUR (Mubur)**, the north-westernmost of the three large islands of the group, is nearly 6 miles in length, and varies in breadth from half a mile to 3½ miles. The summit, 1,330 feet high and densely wooded, is situated in the south-east part of the island. Viewed from the northward or southward it appears as a fairly sharp peak, but from the westward it presents a uniform outline. Noran, a small islet, 160 feet high, lies close off the north point of the island.

*General charts 3543 and 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

The north-western coast of **Mobur** is fringed with reef to about  $1\frac{1}{2}$  cables, with no off-lying danger.

**Pajantai (Penjantan)** is a small level-topped island 215 feet high, lying three-quarters of a mile off the west coast of **Mobur**. Shallow water extends about one cable from the island except off the southern point, which is steep-to.

**Regni**, another wooded islet with black cliffs on its south side, lies near the south-west side of **Mobur**.

**Pulo Manga** is a wooded island 520 feet high, and  $1\frac{1}{4}$  miles in length, on the south side of **Mobur**. At its north-west end it is only separated from that island by an opening a few yards broad.

**Telok Ayer Bandong** is a deep narrow inlet between **Pulo Manga** and the south-east point of **Mobur**. It is about 2 miles in length, 3 cables in breadth, and has general depths of 21 to 17 fathoms, mud. The shores of the inlet are fringed with reef, but except at the head, it projects only a short distance. It affords safe anchorage in 17 fathoms at 6 cables from the head. There are a few inhabitants on its shores.

**NIULWAN (or YANG) MATAK** is  $9\frac{1}{2}$  miles in length, by  $3\frac{1}{2}$  miles in breadth, and attains a height of 1,365 feet in **Gunong Niulwan**, near its south-west extreme; it is a prominent peak dominating everything else in the island.

**Telok Niulwan**, on the south-east side of **Niulwan**, is a shallow inlet 3 miles in length, dividing the southern part of the island into two high and wooded peninsulas, on the coasts of which are many villages. The centre of the island is low.

**Selat Mata (Matak)**, the channel between **Mobur** and **Niulwan** islands, is  $3\frac{1}{4}$  miles in length, narrowing from three-quarters of a mile at the southern end to a quarter of a mile at the northern end, where it opens out into **Telok Mata**. It is clear of dangers, with depths of 13 to 18 fathoms. The shores on either side are fringed with a narrow border of reef, steep-to.

The tidal streams set fairly through the channel, flood to southward and ebb to northward, from one to 2 knots per hour in the narrow part.

**Pulo Semot (Semut)** (*Lat. 3° 24' N., Long. 106° 17' E.*) is a wooded island 710 feet high, lying close northward of **Niulwan**, from which it is separated by **Selat Onass**, one cable wide, and encumbered with rocks and foul ground.

A patch of 3 fathoms lies with the east extreme of the island bearing 204° true, distant about half a mile.

*General chart 2660a.*



*Charts 2244, 1871; Anamba islands. Var. 1° 30' E.*

**Telok Mata (Matak)** is the bay between the northern portion of Mobur and Niulwan, and is  $2\frac{1}{2}$  miles wide between the islands forming the entrance points, Pulo Noran and Pulo Semot. There are several islets and rocks on the north-western side of the bay, the principal being Pungailing and Uching, between which the bottom is uneven and rocky; vessels should pass eastward of them.

**Patch.**—At 6 cables  $354^{\circ}$  true from Pulo Uching there is a coral bank with a depth of 9 fathoms and 30 fathoms around. This patch is out of the fairway to the bay. It is possible there may be less water on it.

Pulo Bahru, 250 feet in height, lies on the eastern side of the bay, a quarter of a mile from the shore; at half a mile southward is a patch of reef outlying the narrow spit of land southward of it.

The general depths in the bay are from 23 to 30 fathoms over a sand and coral bottom; there is no spot that can be particularly recommended as an anchorage.

**TOKONG BELAYER (Belayar)** (*Lat.  $3^{\circ} 27' N.$ , Long.  $106^{\circ} 16' E.$* ) is a conspicuous bare rock like a pillar, 68 feet high, situated about 3 miles northward from Pulo Semot. A reef projects a distance of a quarter of a mile in a northerly direction, and one cable southward from it. The edges of the reef are steep.

**PULO KELONG**, eastward of the northern part of Niulwan, is about 6 miles in length by three-quarters of a mile in breadth, with a ridge of hills from 600 to 770 feet in height, extending nearly the whole length of the island. It is densely wooded, and there are several villages along the coast.

The northern extremity, Tanjong Kirpinis, falls steeply from a hill about 500 feet in height, and is steep-to. On the eastern side, abreast its centre, at a quarter of a mile from the shore, there is a wooded island 300 feet high, and 6 cables in length, with a narrow channel between it and the shore.

**Hooper patches.**—The northern patch is a small sand and coral shoal, with a least depth of 5 fathoms at its southern end. It lies on the western side of Thetis channel at  $1\frac{1}{4}$  miles  $80^{\circ}$  true from Tanjong Muning, south extreme of Pulo Kelong. The southern patch, with a depth of 6 fathoms, lies one mile  $170^{\circ}$  true from the northern patch.

**Pulo Mudai**, westward of the centre of Pulo Kelong, is a narrow islet with a conical summit 160 feet high; a reef extends 2 cables northward of it. The islet is situated at the northern end of the shallow strait formed between Pulo Semot and Pulo Kelong. Reefs block the whole of the opening southward of the middle of Mudai.

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

**Anchorage.**—There is anchorage in a depth of 14 fathoms, coral bottom, at one-third of a mile 277° true from the summit of Pulo Mudai.

**Pulo Piogos, Pidi, Mantong besar, and Mantong kechil** form a chain of narrow wooded islets, extending for 2 miles southward of Pulo Kelong; their western sides have considerable reef. There is a narrow passage with a depth of 5 fathoms between Pulo Kelong and Pulo Piogos, the northernmost of these islets.

The islets are cultivated with cocoanut trees in places, and are inhabited.

**Pulo Biliba**, a wooded island, westward of the above, is 305 feet in height, with a reef extending about 3 cables eastward of it.

**Pulo Lidi**, a narrow wooded island 220 feet in height, lies one mile southward of Pulo Biliba. A reef projects 6 cables from it towards Mantong kechil.

**Selat Tobong** (*Lat. 3° 19' N., Long. 106° 19' E.*) is the channel between the Mantong islands and those to the westward, and has depths of 12 to 14 fathoms, mud. Its northern end terminates in a narrow gutter in the reefs between Pulo Kelong and Niulwan.

**Anchorage.**—There is good anchorage in Selat Tobong, nearly three-quarters of a mile westward of Mantong besar, in 13 fathoms, mud.

**Shoal.**—In the southern entrance to Selat Tobong there is a coral shoal with a depth of 7 fathoms, and possibly less water. It lies 6 cables 185° true from the southern extremity of Mantong kechil, and foul ground extends for one-third of a mile in a 204° true direction from that island. The north-eastern extreme of Niulwan just open westward of Tanjong Muning, the south end of Kelong, bearing 350° true, leads westward of the shoal. The western extreme of Pulo Ginting in line with the western extreme of Tanjong Muning, bearing 356° true, leads midway between the reefs extending on each side of the channel from Mantong besar and Pulo Lidi.

**Pulo Kiladi** is a narrow wooded island,  $2\frac{1}{2}$  miles in length, and 470 feet in height, with its northern end lying 2 cables westward of Pulo Lidi, and on the same reef.

Selat Firnenting, a deep gutter in the coral encumbered with patches, separates Kiladi and Telok Pao from the east coast of Niulwan. Pulo Koran, 270 feet high, also lies on the same reef close to the south-eastward.

Close eastward of Pulo Kiladi is a chain of islets cultivated with cocoanut trees, the tops of the trees varying from 90 to 145 feet in height.

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

South and south-eastward of Pulo Telok Pao the reefs are broken up into narrow detached patches, through which a boat can with difficulty find a passage.

**SIANTAN**, the southernmost large island of the eastern group, is separated from Niulwan by Selat Pananting. The island is  $10\frac{1}{2}$  miles in length, with an extreme width of  $5\frac{1}{2}$  miles, and has several bays with high peninsulas between them. It is mountainous throughout and densely wooded. The summit Gunong Sama, 1,855 feet high, situated on the western side, is conspicuous.

A peak, 1,595 feet high in the north-east part of the island, is conspicuous by its forming a shoulder that falls steeply to the northward. Near the south-east extreme is Gunong Peta, 770 feet high, sharp and conspicuous.

The general outline of the mountain ridges in the broader parts of the island is smooth and rounded, so that the summits are not easy to identify.

**Villages.**—The principal village is Terempah (page 81), near the north end, and along the coast in the various inlets there are numerous small habitations.

**Tanjong Pedass** (*Lat. 3° 14' N., Long. 106° 12' E.*), the north-west point of Siantan, and the south point of entrance to Selat Pananting, is steep-to at the distance of a cable, and slopes sharply down from a hill 610 feet high, a short distance within it.

**Rock.**—At  $3\frac{1}{2}$  cables east-north-eastward from Tanjong Pedass is a small rock, one foot above high water, with 3 fathoms close-to and a depth of 11 fathoms between it and the shore.

At  $1\frac{1}{2}$  miles southward of Tanjong Pedass and half a mile from the coast there is a coral bank of 12 fathoms. Elsewhere the 20-fathoms contour line maintains a distance of about 2 to 3 cables from the west coast.

**West coast. — Telok Rambutan** (*Lat. 3° 7' N., Long. 106° 14' E.*) is an inlet on the south-west coast of Siantan, one mile in length by half a mile in width at its entrance, with depths of 8 to 12 fathoms, mud. On the western side, a short distance within the entrance, the reef projects for 2 cables; on the eastern side the reef follows the coast closely.

The inlet is fully exposed to the south and is somewhat confined for anchoring.

**Telok Ayer Bini** lies about 2 miles eastward of Rambutan. It is about  $1\frac{1}{2}$  miles in length, and nearly one mile in breadth between Tanjong Baik, a low point, and Pulo Soe, a flat-topped wooded island,

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands.*

300 feet in height, lying near the coast; near its head it is about 2 cables wide.

A small reef lies  $1\frac{1}{2}$  cables off the White rocks, 10 feet high, situated close to the east point of Telok Luing, within Tanjong Baik. There are some houses in this cove.

The reef on the western side extends to a distance of about one cable; on the eastern shore, at three-quarters of a mile within Pulo Soe, a detached reef lies parallel with the coast at a distance of  $1\frac{3}{4}$  cables. Abreast the northern end of this detached reef, at the distance of  $2\frac{1}{4}$  cables from the west shore, is a patch of  $1\frac{3}{4}$  fathoms; it is about 33 yards in length, and is not easy to see until close-to.

**Anchorage.**—The depths in the centre of the bay are from 16 to 18 fathoms, mud, affording good anchorage, with the White rocks in line with Tanjong Baik, distant two-thirds of a mile.

**Tanjong Katong**, situated 2 miles east-south-eastward from Ayer Bini, is the south-east extreme of Siantan, and has a black flat-topped rock about 20 feet high close southward. It forms the southern end of a peninsula, of which Gunong Peta, 770 feet high, is the summit.

**Coast.**—To the westward is an inlet  $1\frac{1}{4}$  miles deep open to the south, and therefore exposed during the south-west monsoon. Reef extends from the coast from one to 2 cables, increasing to 3 cables at its head. The water shoals from 19 to 12 fathoms, coral bottom, at half a mile from the head.

**Siantan, north coast.**—**Terempa (Terempah) cove** (*Lat.  $3^{\circ} 13' N.$ , Long.  $106^{\circ} 13' E.$* ), situated on the north coast of Siantan, is three-quarters of a mile wide between its entrance points, and nearly one mile in length to its head, where there is a sandy beach on which the village of Terempa stands. The coast on either side is fringed by reef to about  $1\frac{1}{2}$  cables, except near the village.

**Village.**—Terempa is the principal village in the group, and contains the residence of the Dutch Government official. Very good drinking-water can be obtained here from a spring.

**Anchorage.**—There is anchorage in a depth of 16 fathoms, sand and mud, at one-third of a mile from the head of the cove, where there are usually some sailing schooners at anchor.

**SELAT PANANTING**, separating Siantan from Niulwan, is a channel from three-quarters to  $1\frac{3}{4}$  miles wide, with depths of 10 to 24 fathoms. The western portion of this channel is deep and clear, but eastward of Tanjong Tuman it becomes much obstructed by reefs. The fringing reef off Tanjong Tuman projects 3 cables from the shore, and its edge is irregular and broken up. Off the south-eastern extreme

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

of Niulwan, reef and foul ground extends nearly across the strait, leaving only a navigable channel 2 cables wide on the Siantan side.

Pulo Jankat is a wooded islet, 105 feet in height, on the coast reef, abreast Batu Birla.

**Telok Bara.**—Half a mile to the southward of Pulo Jankat, is the entrance to a narrow channel leading through the fringing reef to Telok Bara. On the west side of the cove there are two waterfalls close to each other.

**Batu Birla and Misabong**, 385 and 435 feet in height, respectively, lie about half a mile off the north-east side of Siantan, on the reefs which block the eastern entrance of Selat Pananting. Several smaller islets stand on the same reefs.

**Siantan island, east coast.**—From Telok Bara the coast southward for 6 miles to Tanjong Katong, the southern point of the island, has numerous small villages at intervals.

**Pulo Bajau, or Pulo Nyamok**, lies eastward of Siantan, with Selat Simangi between. It is an island about 5 miles in length, of very irregular shape, indented on the north, south, and east sides by deep bays; the western portion is known as Pulo Bajau, and the eastern or larger portion as Nyamok. There are two prominent peaks; the western one, Gunong Simangi, 785 feet in height, the other peak, 780 feet high, lies one mile north-eastward of it. There are inhabitants along the shores of nearly all the inlets, and in several parts of the island cocoanuts are cultivated.

**Selat Batu Birla** (*Lat. 3° 11' N., Long. 106° 17' E.*) is the continuation southward of Selat Pananting; it is a strait 2 miles in length, separating Pulo Batu Birla and Pulo Misabong from Siantan, with depths of 11 to 12 fathoms, but is only 2 cables wide between the edges of the reefs. There is a detached patch of reef about a cable off the reef extending south-eastward of Jankat, on the west side of the northern entrance. There are no leading marks for this strait, and the tidal streams run somewhat strongly, flood to the southward and ebb to the northward.

**Directions.**—Neither Selat Pananting nor Selat Batu Birla are channels that can be recommended, but in case of necessity the following directions may be useful concerning their navigation, but the eye from aloft should be the principal guide:—

Entering Selat Pananting from the westward, keep in mid-channel; before coming abreast of Tanjong Kangor (half a mile north-west of Tuman), bring the western extreme of Niulwan in line with another black cliffy point south-eastward of it, bearing 320° true. Keep these marks on, astern, until the northern extreme of Pulo Bata Birla bears

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

101° true in line with the north extreme of Pulo Luyong, and steer for it on that bearing till the western extremes of Pulo Batu Birla and Pulo Misabong are in line bearing 159° true. Then alter course for those points, keeping them in line until abreast of a small detached patch of reef which will be passed close to on the starboard hand when Pulo Jankat is abeam, when course must be altered to clear the reef extending from Pulo Batu Birla. Thence, keep in the fairway of the channel between the reefs, and when to the southward of Pulo Misabong either steer north-eastward through Selat Jalan or south-westward into Selat Simangi.

**Selat Jalan** separates the north-west part of Pulo Bajau from Pulo Misabong and from the eastward leads to Selat Simangi and Selat Batu Birla. It is a quarter of a mile wide between the edges of the reefs, with depths of 10 to 20 fathoms.

The tidal streams set through with some strength, flood to the south-west and ebb to the north-eastward.

**Selat Simangi**, separating the west coast of Pulo Bajau from Siantan, varies in width from  $3\frac{1}{2}$  to 2 cables between the edges of the reefs. The depths are 12 to 15 fathoms, but there is a sand and coral patch of  $5\frac{1}{2}$  fathoms in the centre of the strait. The edges of the reefs project on the Siantan side from  $1\frac{1}{2}$  to  $3\frac{1}{2}$  cables, and there are detached patches on that side also; on the other side the reef follows the shore more closely.

**Selat Barawa** is the continuation of Selat Simangi in a south-south-east direction and its southern entrance; the channel is reduced to little more than one cable in width between the fringing reefs within its entrance, opening southward into a deep bay formed between Tanjong Katong and Tanjong Suka on the east side.

**Anchorage.**—There is anchorage in 15 fathoms, sand, in the bay off the south entrance to Selat Barawa. The head of the bay on the south side of Pulo Bajau is encumbered with reef. Pulo Berala, 140 feet in height, and covered with cocoanut trees, lies half a mile off Tanjong Katong, west side of approach to the bay.

**Pungelat** (*Lat. 3° 6' N., Long. 106° 21' E.*), Oro-oro, Batu Itam, Pirmotos, and Tungeran, constitute a chain of inhabited islets from 135 to 260 feet in height, extending in a south-west and opposite direction for  $3\frac{1}{2}$  miles, and situated south-eastward of Pulo Nyamok, with Favorite channel between.

**FAVORITE CHANNEL** (Selat Tanjong Suka) is two-thirds of a mile wide, reduced in one place, on the western side of the channel near the centre of its length, to about  $4\frac{1}{2}$  cables by a patch of reef that dries 3 feet, and generally

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

shows clearly; there is another patch near the same shore at three-quarters of a mile south-west of it. There are depths of 22 to 24 fathoms in this channel, which is straight and clear of danger with the exception of the reefs alluded to. The tidal streams set straight through, flood to the south-westward and ebb to the north-eastward, from  $1\frac{1}{2}$  to 2 knots per hour. On the flood, with a southerly wind, there are tide-rips and overfalls in the southern part of the strait.

**Clearing marks.**—The west side of Pulo Gueta, in line or just open of the north-western entrance point of Favorite channel, bearing  $32^\circ$  true, leads eastward of the reefs in the channel.

**Anchorage.**—There is anchorage on the north-west side of Pungelat in 17 to 18 fathoms, sand, at  $1\frac{1}{2}$  cables from the island, with Gunong Munjan (the summit of Pulo Tanapuniat) in line with the south-east point of Oro-oro.

**PULO TANAPUNIA (Memperuk)** (*Lat.  $3^\circ 4' N.$ , Long.  $106^\circ 21' E.$* ) is an island  $2\frac{3}{4}$  miles in length. Gunong Munjan, its summit, is 760 feet in height, and is conspicuous from all views. Pulo Abong, 345 feet in height, lies close westward of its southern end.

The channel westward of Pulo Tanapuniat, separating it from the chain of islets mentioned above, is one mile wide between Pulo Tungeran and Pulo Abong, narrowing to a little over one cable in width near Batu Itam; it is not recommended as a ship channel. There are inhabitants on both sides of it.

Batu Rakit consists of rocks from 2 to 6 feet high, situated at a quarter of a mile off the centre of the east coast of Tanapuniat.

**Howard rock**, with 13 feet water, lies three-quarters of a mile  $102^\circ$  true from the north point of Pulo Tanapuniat, and nearly 2 miles northward of Batu Bini.

**Clearing marks.**—The south-west extreme of Mankian Pandok, in line with the south-west extreme of Pulo Gueta,  $342^\circ$  true, leads three-quarters of a mile eastward of Howard rock, and leads also just eastward of the eastern Chabrol patch.

**Walsh patch**, of coral, with a depth of 6 fathoms, lies  $2\frac{1}{4}$  miles  $66^\circ$  true from Pulo Abong, with depths of 20 to 27 fathoms around.

For Pascoe rock and other dangers to the southward, *see* page 74.

**AKAR, BOITEU, &c.**, form a group of six islands and islets extending from one to 4 miles south-eastward of Tanapuniat. Pulo Akar,  $1\frac{1}{2}$  miles in extent, and 525 feet in height, the largest and easternmost of the group, is uninhabited and densely wooded. Boiteu and Baba stand on the same reef, with another island lying between

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands.*

them and Akar. The westernmost islet of the group has a sharp summit 240 feet in height.

**Batu Laki** is a rock 3 feet high lying in the fairway of the channel between this group of islands and Pulo Tanapuniat, at  $8\frac{3}{4}$  cables  $80^\circ$  true from Tanjong Baluntao, and is steep-to.

**Batu Bini** is a rock that dries 3 feet, also in the fairway, at 4 cables  $359^\circ$  true from Batu Laki.

**Egeria rock** (*Lat.  $3^\circ 2' N.$ , Long.  $106^\circ 27' E.$* ), a coral head of 2 fathoms with 20 to 30 fathoms at a short distance, lies  $1\frac{9}{10}$  miles  $103^\circ$  true from the north-east extreme of Akar island. Half a mile  $264^\circ$  true from Egeria rock is a patch of  $3\frac{1}{2}$  fathoms with deep water between.

**Nonseu (Nonsiu)**, about one mile southward of Akar, is the south-easternmost island of the northern group of the Anambas. It is a narrow wooded island, 195 feet in height, and three-quarters of a mile in length. Foul ground extends for nearly 2 cables southward of the island. The channel between it and Akar is deep and clear, but there are frequently tide-rips across it.

The tidal streams run, flood to south-westward and the ebb to the north-eastward, about one knot per hour in the vicinity of Nonsiu.

**PULO PANJANG** is the largest of a group of ten islands and islets to the northward of Akar, and is 2 miles in length east and west, by half a mile in breadth near its centre. It has two prominent wooded peaks, three-quarters of a mile east and west of each other, connected by a high saddle. The western peak is 1,050 feet, and the eastern 1,140 feet in height, and it is the highest island eastward of Siantan. Two islets lie off the southern coast.

**Pempang** (*Lat.  $3^\circ 7\frac{1}{2}' N.$ , Long.  $106^\circ 27' E.$* ) is the easternmost of the group. It is 460 feet in height, nearly a mile in length, and is fairly steep-to. The island is wooded and inhabited.

**Mantala (Mentala)**, southward of Pulo Panjang, is a narrow wooded island 300 feet in height, and one mile in length. The island is cultivated in places with cocoanut trees, but is uninhabited.

**Pulo Pejul and Pulo Panginding**, connected by reef, and about one cable apart, lie westward of Pulo Panjang and separated from it by Selat Telok Dalam, from 2 to 3 cables wide, with depths of 12 to 15 fathoms. The islands together are 2 miles in length, densely wooded, and have a few inhabitants. Pulo Pejul is 760 feet, and Panginding 815 feet in height. Close off the north-west coast of Pulo Pejul there are two high islets, and close to the north point of

*General chart 2660a.*



*Charts 2244, 1371, Anamba islands. Var.  $1^{\circ} 30' E$ .*

Panginding is another. An islet, 115 feet high, from which reef projects for a short distance, lies half a mile north-westward from the last-mentioned islet.

**Anchorage.**—There is anchorage sheltered from the southerly winds in a depth of 13 fathoms, sand and coral bottom, in the space between the above-mentioned islets, with the islet close to the north point of Panginding bearing  $86^{\circ}$  true, and the islet to the northward bearing  $30^{\circ}$  true, distant  $3\frac{1}{2}$  cables.

**Pulo Luyong** (*Lat.  $3^{\circ} 11' N.$ , Long.  $106^{\circ} 22' E.$* ), 375 feet in height, with well-defined peaks, is a narrow wooded island  $1\frac{3}{4}$  miles in length, lying about 2 miles north-westward of Pulo Pejul.

**A patch** of 2 fathoms lies half a mile  $289^{\circ}$  true from the head of the west bay in the low part of Pulo Luyong, with depths of  $3\frac{1}{2}$  to 7 fathoms around.

**Pulo Gueta**, 290 feet in height, is a wooded island, 8 cables in length, lying close southward of Pulo Luyong and on the same reef.

**Chabrol patches** are two in number, half a mile apart, and steep-to. The western one has a depth of  $4\frac{1}{2}$  fathoms, and is situated 8 cables  $199^{\circ}$  true from the south-west point of Pulo Gueta. The other has  $3\frac{1}{2}$  fathoms, and lies one mile  $168^{\circ}$  true from the same point.

**Esperance reef** (*Lat.  $3^{\circ} 12' N.$ , Long.  $106^{\circ} 23' E.$* ), with a sand-bank that dries 6 feet on its southern end, is a reef lying one mile  $58^{\circ}$  true from the north point of Pulo Luyong.

**Shoals.**—A ridge of sand and coral shoals, with depths of from  $4\frac{1}{4}$  to 8 fathoms over them, extends 2 miles  $30^{\circ}$  true from Esperance reef. As there may be less water on these shoals they should be avoided. At one mile  $24^{\circ}$  true from Mankian Pandok there is a coral head with a depth of  $3\frac{1}{2}$  fathoms, and a 3-fathoms patch lies two-thirds of a mile  $165^{\circ}$  true from the coral head.

A reef awash lies  $1\frac{1}{2}$  miles  $20^{\circ}$  true from Esperance reef with a clear channel between, having depths of 14 to 16 fathoms.

**Clearing marks.**—The south-east point of Pulo Gueta in line with the north point of Pulo Oro-oro bearing  $210^{\circ}$  true (the entrance to Favorite channel being just closed), leads between Esperance reef and the last-mentioned reef, and eastward of the line of coral shoals extending northward of Esperance reef.

**Mankian Pandok**, a small island, 160 feet in height, cleared for cultivation, lies with its peak  $1\frac{1}{4}$  miles north-west of the north extreme of Pulo Luyong. It has a sandy spit at its southern end, and

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

reef extends for nearly 2 cables westward from the island. There are two wooded islets at 2 and 5 cables south-eastward of it.

**Pulo Isan**, 570 feet in height, is wooded, of irregular shape, and situated north-north-eastward from Pulo Panjang. On the western side and northward of the island, reef and foul ground extend for a considerable distance. Immediately southward of Pulo Isan, there is an islet 280 feet high, with a sandy isthmus extending in a south-westerly direction for a quarter of a mile, connecting it with a promontory 80 feet high. Between this promontory and Pulo Panjang there is a deep passage 4 cables wide. Another islet, Nibong, 135 feet high, is situated close south-eastward of the 280-foot islet.

**PULO SELEI (SELAJ)** (*Lat. 3° 12' N., Long. 106° 29' E.*), 530 feet in height, and 2 miles in length, lies 2 miles eastward of Pulo Isan, and is also of irregular shape. Its summit shows sharp from the northward and southward, but broad-topped from other views. The bays on the south and east sides are foul and rocky; the one on the north side is also foul near the head, but it affords anchorage in a depth of 13 fathoms in the centre, with protection from southerly winds.

A narrow island, 305 feet high, and one mile in length, lies close to the north-westward of Pulo Selei, affording temporary protection on its south-east side from northerly winds, but the anchorage was not closely sounded. There is only a narrow boat channel between the islands.

**Bossom**, a wooded island 3 to 4 cables in extent, and 335 feet in height, lies north-west of the island just mentioned, with an islet 110 feet high between, with which it is connected by reef. A small patch awash lies 2 cables 204° true of the 110-foot islet.

**Kudok**, a small islet 85 feet high, lies  $1\frac{3}{16}$  miles south-west from Bossom.

**SAGU DAMPAR and SAMA**, 500 and 225 feet high, respectively, standing on the same reef and close to each other, are together nearly 2 miles in length; the south-eastern part of Sagu Dampar lies 7 cables westward of Bossom. Nearly in the centre of the channel between them is a rock awash at low water, with depths of 4 to 7 fathoms close around it, lying  $5\frac{1}{2}$  cables 264° true from the south point of Bossom. With the exception of this rock the channel is clear, passing westward of Pulo Selei and Bossom. The channel between Pulo Isan and Sagu Dampar, is too foul for a vessel to attempt a passage.

**PULO LUBONG GAI** is a narrow wooded island of smooth outline, 335 feet high and 2 miles in length, with Ipil islet close to its

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

southern end. It lies 2 miles north-west from Sagu Dampar, with a deep and clear channel between.

**Pulo Manguan** (*Lat. 3° 18' N., Long. 106° 24' E.*) lies close westward of the north point of Lubong Gaii, and is  $1\frac{1}{2}$  miles in length. The summit, 465 feet high, shows conspicuously. The space included between the south coast of this island and the coast of Pulo Lubong Gaii encumbered with reef.

**Mankian**, 140 feet in height, and cultivated with cocoanut trees, lies  $1\frac{1}{2}$  miles south-west of Lubong Gaii. Reef extends on all sides to a distance of one to 2 cables except to the north-eastward, where it skirts the island closely. The passage between Mankian and Lubong Gaii is clear of danger.

**A patch** of  $2\frac{1}{2}$  fathoms, coral, lies 193° true about 7 cables from the south extreme of Mankian, steep-to on its southern side.

**Hale patch**, with a depth of  $3\frac{1}{2}$  fathoms over a coral bottom, is small, and situated  $1\frac{1}{2}$  miles 306° true from the northern extreme of Pulo Mankian.

**Thetis reef** is a coral reef half a mile in length, lying 2 miles 252° true from Pulo Mankian, with depths of 11 to 12 fathoms between. Patches with 3 to 5 fathoms on them extend for one mile to the northward of this reef, and there is a patch of  $4\frac{1}{2}$  fathoms  $3\frac{1}{2}$  cables 204° true of Thetis reef. A patch of 4 fathoms lies 6 cables westward of Thetis reef.

There is a narrow reef over one mile in length, with a sand cay that dries 5 feet, lying with its north end one mile 238° true from Thetis reef.

**Sampa**, an islet 200 feet high, wooded, and 7 cables in length, lies close north-west of Pulo Manguan.

**Matiana (Matianak)**, one-third of a mile in length, and 180 feet in height, lies  $1\frac{1}{4}$  miles northward of Sampa, with a rock or islet, 30 feet in height, in the channel between.

**PULO MINJALIN (MENJALIN)** (*Lat. 3° 23' N., Long. 106° 26 $\frac{1}{2}$ ' E.*), Pulo Stuju, Pulo Lamun, and Pulo Passu, constitute a group of islands occupying a space nearly 2 miles square, situated about 5 miles eastward of Pulo Kelong; they are the north-easternmost islands of the Anambas.

Pulo Minjalin, the westernmost and largest of the group, is  $1\frac{1}{2}$  miles in length, with a rounded summit, 430 feet in height, near the centre. The western coast is embayed, but the water is too deep to afford convenient anchorage.

*General chart 2660a.*

*Charts 2244, 1371, Anamba islands. Var. 1° 30' E.*

**Pulo Stuju**, a level-topped narrow island, 215 feet in height, lies north-eastward of Minjalin, and on the same reef.

**Pulo Lamun**, about one mile in length, lies eastward of Minjalin. Reef extends south-eastward of it for upwards of half a mile.

Pulo Passu, with a conical summit 200 feet high, lies close north-eastward of Pulo Lamun, with islets and rocks between.

**Anchorage.**—On the east side of Pulo Minjalin, in the bay formed by the projection to the eastward of the other islands of the group, there is temporary anchorage in a depth of 15 fathoms, sand and coral, with the south-east extreme of Minjalin bearing 233° true, distant 4 cables.

**Alarm bank**, lying three-quarters of a mile east-north-eastward from Pulo Passu, is a bank of sand and coral half a mile in extent, with depths of  $4\frac{3}{4}$  to  $5\frac{1}{2}$  fathoms, and possibly less, water. A small patch of 6 fathoms lies  $1\frac{4}{10}$  miles 69° true from Pulo Passu, with 20 fathoms between, and nearly half a mile still further eastward a cast of 15 fathoms was obtained. Heavy overfalls and tide-rips mark these banks, and they should be avoided.

**THETIS CHANNEL** lies between the islands and islets immediately fronting the east coast of Niulwan, and those groups of islands lying to the eastward that have just been described. Its northern entrance lies between Pulo Kelong and Pulo Minjalin, and its general direction is south, between the several reefs that have been described in connection with the islets contiguous to them. The depths range from 30 to 36 fathoms in the northern part, decreasing to 11 and 12 fathoms in the central parts. It probably could be navigated from aloft with the sun in a favourable position, but there is apparently little to be gained by using it. The route outside the islands seems preferable.

**Tidal streams.**—In Thetis channel the flood sets to the southward, and the ebb to the northward, from three-quarters to  $1\frac{1}{4}$  knots per hour.

**THE NORTH NATUNA ISLANDS** are situated about 130 miles north-eastward of the Anamba islands, and about 75 miles eastward of the main route up the China sea. Pulo Laut, the larger island, is 896 feet in height, and Pulo Sekatung, close to its north extreme, is 364 feet in height. They are inhabited by Malays and Chinamen, and produce various sorts of fruits.

Reefs extend about  $3\frac{1}{2}$  miles off the south-west extreme of Pulo Laut, gradually reducing its distance northward to Sekatung, the north extreme of which is fairly steep-to. Reefs extend a considerable distance eastward of the islands, full details of which will be found in Vol. IV.

*General chart 2660a.*

## CHAPTER III.

MAIN ROUTE TO HONG KONG.—DESCRIPTION OF ISLANDS,  
REEFS, AND SHOALS.

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Variation nearly stationary.

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Directions for making the passage by the Main route to and from China are given in Chapter I.; a description of the islands and shoals adjacent to this route northward of the Anamba islands, and Tioman islands, before described, will now be given.

## EASTERN SIDE OF MAIN ROUTE.

*Chart 2660a. Var. 2° 0' E.*

**Caution.**—Vessels should not attempt to pass eastward of the banks that are here described, as numerous shoals exist over a very large central area known as “Dangerous ground,” which have not been correctly charted. Described in Vol. IV.

**Currents and tides** (*See Chapter I.*).—Whilst H.M.S. surveying vessel *Rifleman* was at anchor on the reefs, during both monsoons, careful observations were taken of the set of the current on the reefs, which, for sixteen hours out of the twenty-four, invariably set to windward, generally with the greatest force when the monsoon was strongest; it is not to be supposed that this action occurs at any great distance from the reef, it being an eddy, more or less.

The rise of tide at springs was about 5 feet, and at neaps one to 2 feet; one tidal stream in the twenty-four hours.

**BANKS on eastern side.**—**Vanguard bank**, having 9 fathoms least water, and general depths of 20 to 60 fathoms, is crescent-shaped, about 34 miles in length, and has an average breadth of 6 miles. The position of the 11 fathoms on its eastern end is lat. 7° 30' N., long. 109° 55' E., or about 110 miles eastward of Charlotte bank, the southernmost bank on the western side of the main route, page 99.

**Grainger bank**, the centre of which lies 37 miles 64° true from the eastern patch of the Vanguard, is 5½ miles in length by 2 miles in breadth. There are coral heads with 6 to

*General chart 1263.*

*Chart 2660a. Var. 2° 0' E.*

8 fathoms over them, and depths of 10 to 20 fathoms around ; the coral bottom is visible over nearly the whole of it.

**Prince Consort bank** lies between the Vanguard and the Prince of Wales bank, and extends about 16 miles north and south by 9 miles east and west. No danger exists on it ; the general depths are from 30 to 50 fathoms, sand and coral, the least water found being on some coral heads near the western edge, with depths of 10 to 13 fathoms, with no bottom at 200 fathoms at a short distance.

**Prince of Wales bank**, between 20 to 33 miles east-north-eastward of Prince Consort bank, is 12 miles in extent north-east and south-west, and 7 miles in breadth ; it is of coral formation, with irregular depths, there being several heads with depths of 8 to 10 fathoms, and one of 4 fathoms near its north-west corner, in lat. 8° 8' N., long. 110° 27' E.

**Alexandra bank**, about 5 miles south-eastward of Prince of Wales bank, is 5 miles in length north and south, 3½ miles in breadth, and steep-to. A patch with 3 fathoms lies near the eastern edge, and there are others with 6 to 7 fathoms ; the general depth is about 15 fathoms, the bottom, coral, distinctly visible.

*Charts 2660a, 2660b.*

**RIFLEMAN BANK** is about 30 miles in length in a north and south direction by about 13 miles in breadth. Shallow patches, varying from 1½ to 7 fathoms, exist around the edges, within which are depths of 20 to 40 fathoms, sand and coral ; around the bank are depths of about 500 fathoms.

Bombay Castle shoal, with 1½ fathoms, situated at the north end of Rifleman bank, in lat. 7° 56' N., long. 111° 42' E., is marked by heavy breakers except during the finest weather.

Bombay Castle, Orleana, Johnson, and Kingston shoals, of former charts, were found by Commander Ward, of H.M.S. *Rifleman*, to be patches on the edges of Rifleman bank, and are named accordingly. It is quite possible that other small shoal patches may exist on the bank.

**Owen shoal**, reported by the ship *David Scott*, in 1835, to be about 2 miles in extent, and to have a depth of 3½ fathoms, over coral, is charted 22 miles north-eastward of Rifleman bank, in lat. 8° 8' N., long. 111° 59' E. It has not been examined.

**Ladd reef** (Lat. 8° 39' N., Long. 111° 40' E.), about 42 miles northward of the Rifleman, is a coral reef 3 miles in length, east and west, and about one mile in breadth. In the centre of the reef is a lagoon with a bottom of white sand. The surrounding reef uncovers

*General chart 1263.*

*Charts 2660a, 2660b. Var. 2° E.*

at half tide in many places, and at low water it is almost impossible for boats to cross over into the lagoon.

**Spratly (or Storm) island**, situated 14 miles eastward from Ladd reef, is a bare flat island about 8 feet high,  $2\frac{1}{2}$  cables in length, and  $1\frac{1}{2}$  cables in breadth, with a margin of bright white sand and broken coral. At a distance of 3 or 4 miles, in the breeding season, the birds standing erect look like small bushes.

The island is on the west end of a coral bank, which is  $1\frac{1}{3}$  miles in length by 7 cables in breadth. Northward of the island at three-quarters of a mile distant, there is a depth of  $3\frac{1}{2}$  fathoms close to the edge of the bank, decreasing towards the shore. North-eastward the depth is 7 or 8 fathoms not quite half a mile from the island. Rocky ledges, dry at low water, surround the island, requiring caution when landing, which during the south-west monsoon may be effected on the lee side. The bank is steep-to, the sea breaking heavily upon it, except in very fine weather.

The *Rifleman* anchored in about 6 fathoms on the north-east point of the bank, fairly sheltered from the south-west, with the extremes of the island bearing about  $221^\circ$  true and  $244^\circ$  true, and the extreme of the breakers on the western edge,  $264^\circ$  true.

In the months of June and July turtle frequent the island, and they may possibly do so at other seasons. Numbers were taken on the beach, being easily turned over by two or three men. Quantities of their eggs were found on the south-west side of the island. Sea birds' eggs covered the ground in the months mentioned.

There were no signs in 1889 of anyone ever having tried to live there.

**Tides.**—Observations at Spratly island in the summer months showed but one tide during the 24 hours, and in the early part of July it was found to be high water at 9h. a.m., the rise and fall being  $5\frac{1}{4}$  feet. The direction of the stream at the north-east corner of the bank was south-westward during the rising tide, and from south-east to east-north-east during the falling tide.

*Chart 2660b.*

**Amboyna cay** (*Lat.  $7^\circ 51' N.$ , Long.  $112^\circ 55' E.$* ), about 68 miles eastward of Rifleman bank, and at the south-west extreme of a small coral bank, is 150 yards in extent, and 8 feet high. It is surrounded by coral ledges, partly dry at low water, and steep-to, to the distance of nearly 2 cables in places, upon which the sea breaks heavily with any swell.

A pile beacon, composed of driftwood collected on the cay, a few lumps of coral, &c., was erected in the centre of the island, and possibly still exists.

*General chart 1263.*

*Chart 2660b. Var. 2° 0' E.*

**A bank**, 2 cables wide, extends about one mile north-eastward of the cay, with a depth of 4 fathoms at about a third of a mile from it; at the extreme of the bank the water deepens suddenly from 9 to 17 fathoms, and thence to deep water.

Anchorage on this bank was obtained by the *Rifleman*, in 5 fathoms, in the south-west monsoon, fairly sheltered by the cay from the prevailing wind.

**A reef**, with a depth of 2 to 2½ fathoms, was reported by H.M.S. *Wanderer* in 1889, to lie with the centre of Amboyna cay bearing 137° true, distant from half to one mile; it is too near the cay to be shown on the chart, which is on a small scale.

Eastward of Amboyna cay is the edge of the "dangerous ground" still unsurveyed, and which should be avoided, as before mentioned. The following reefs lie off its west and north-west edges.

**Tides.**—By observations at Amboyna cay 2 days before neaps, the maximum rate of the tidal stream was 1·4 knots per hour, the flood stream setting northward, the ebb westward; flood commencing at 11 p.m., and the ebb at 6 a.m.; rise and fall doubtful.

Remains of huts, which had been made of stones, pieces of coral, planks and bamboos, parts of an old boat, &c., were seen on the cay (1889), all covered with a white coating of guano, denoting that it is a long time since anyone was working guano, or living on Amboyna cay.

**Stags shoal**, northward of Amboyna cay, was reported in 1802 in lat. 8° 24' N., long. 112° 57' E., as consisting of rocks showing above water.

The *Rifleman*, in 1867, obtained 1,085 fathoms, ooze, in the position assigned to Stags shoal. Commander Ward, R.N., of that vessel, found Amboyna cay to be 11 miles further west than reported by Mr. Trinder, commanding the *Amboyna*, who discovered both dangers; and it is possible, therefore, that the position of the Stags given may be 11 or 12 miles eastward of the truth. H.M.S. *Renard*, in 1862, got upon the position ascribed to the Stags shoal, and steered a few miles east and west, but could not discover it. It is probably the north end of Lizzie Webber shoal (Vol. IV.).

**LONDON REEFS.**—The London reefs, four in number, lie about 60 miles north-eastward of Rifleman bank, extend over a distance of about 38 miles in an east and west direction, and are steep-to.

Like most dangers in the China sea, the London reefs are surrounded by deep water, thus rendering the lead useless; great caution is therefore necessary when navigating in the vicinity of these reefs,

*General chart 1263.*



*Chart 2660b. Var. 2° 0' E.*

and vessels should not stand towards them with the sun shining ahead, as under these circumstances it becomes almost impossible to distinguish shoal water or breakers.

**West (London) reef** (*Lat. 8° 51' N., Long. 112° 12' E.*) is about 4 miles in extent with several detached coral heads dry at low water around its edge. In the centre of the reef there are depths of 6 to 10 fathoms, with several coral heads. The only approach to the centre is from the south-east side, but so many coral patches exist that the navigation is hazardous. On the east side of the reef is a sand cay, 2 feet high.

**Central reef** is a coral patch awash, half a mile in extent, with a shallow lagoon within the belt of coral, at 9 miles north-eastward of West reef. On the south-west extreme of the reef is a sandbank, probably covered at high-water springs.

This reef lies directly in the track of vessels working up or down the China sea. It is not always marked by breakers, like those which so readily point out the positions of East and West London reefs.

**East (London) reef**, 16 miles eastward of West reef, is 7 miles in length, east and west, and from one to 2 miles in breadth. The coral around its edges encloses a lagoon, having depths of 4 to 8 fathoms with many rocky heads; no entrance into the lagoon was discovered. The sea breaks heavily on the reef, and on its western extreme are one or two rocks which seldom cover.

**Cuarteron reef**, the easternmost of the London reefs, at about 10 miles eastward of East reef, is awash, crescent-shaped, about 3 miles in length, and very steep-to. Although deep water is found close to all of these reefs, there was generally some slope from the edges, on which the *Rifleman* could anchor with safety for a short period, to enable the position to be fixed, but on Cuarteron reef no anchorage could be found, it being "steep-to" all round.

**The FIERY CROSS or N.W. Investigator reef** is a coral reef having several dry patches, upon most of which the sea breaks even in light winds, or with a slight swell. It is 14 miles in length, north-east and south-west, and 4 miles in breadth. The largest dry patch is at its south-west end in lat. 9° 32' N., long. 112° 52' E.

Dhaulle reef, reported in 1826 to exist in lat. 9° 32' N., long. 112° 24' E., is considered to be identical with one of the neighbouring reefs. In this locality a depth of 1,060 fathoms is charted.

**Discovery Great reef**, the south point of which lies east-north-eastward 55 miles from Fiery Cross reef, in lat. 10° 1' N., long. 113° 51' E., is a narrow coral reef, about 7 miles in length, the greater part of which dries at low water, but with several large rocks

*General charts 2660b, 1263.*

*Chart 2660b. Var. 2° 0' E.*

always showing; in the centre is a lagoon, which appeared to be shallow, and to have no passage leading into it. No bottom was found with 100-fathoms line within a short distance of any part of the reef, except off its north end, where the *Rifleman* anchored in 42 fathoms nearly half a mile from the rocks.

The Hainan island fishermen reported a reef or shoal lying 10 miles north-eastward of Discovery Great reef, but depths of 40 fathoms, no bottom, have been found in that locality.

**Discovery Small reef**, lying about 10 miles eastward from the south point of Discovery Great reef, is a round coral patch, a third of a mile in diameter, dry in places at low water, with very deep water all round.

**Western or Flora Temple reef** (*Lat. 10° 15' N., Long. 113° 37' E.*), is the westernmost reef in this part of the China sea, and dangerous, having patches of rock just under water at the south-west part, and from one to 3 fathoms in other places. It is a narrow reef  $1\frac{1}{2}$  miles in length, north-east and south-west, with depths of 20 to 70 fathoms close-to, and no bottom at 200 fathoms at a short distance.

*Plan 1201, Tizard bank and reefs.*

**TIZARD BANK, with REEFS and ISLANDS.**—Tizard bank lies about 16 miles north-eastward of Discovery Small reef. It, like the generality of the large coral banks in the China sea, consists of a lagoon bordered by reefs dry at low water, two with islands on them, and a third with a sand cay. The bank is about 30 miles in length in an east and west direction, with an average breadth of about 8 miles. In the lagoon are several coral heads of 5 to 6 fathoms. The tops of the few trees on the islands may possibly be seen from a distance of 8 to 10 miles.

Hainan fishermen, who subsist by collecting trepang and tortoise-shell, were found upon most of these islands; some of them remain for years amongst the reefs. Junks from Hainan (Tong King gulf) annually visit the islands and reefs of the China sea with supplies of rice and other necessities, for which the fishermen give trepang and other articles in exchange; the junks leave Hainan in December or January, and return with the first of the south-west monsoon. The water found in the well on Itu Aba island was better than elsewhere.

**Itu Aba** (*Lat. 10° 23' N., Long. 114° 21' E.*), the larger of the two islands, lies at the north-west corner of Tizard bank, and is three-quarters of a mile in length. The reef surrounding it extends in some places nearly half a mile, its limits being generally defined by a line of breakers. The island is covered with small trees and bushes, and

*General charts 2660b, 1263.*

*Plan 1201, Tizard bank and reefs. Var. 2° 0' E.*

there are a few cocoanut and plantain trees near a well, the tops of which are about 25 feet above the sea.

**Sand cay.**—About 6 miles eastward of Itu Aba island is a sand cay, near the centre of a reef three-quarters of a mile in diameter. This cay which was a mere patch of sand when visited by the *Rifleman* in 1867 had bushes on it about 9 feet high; when seen from H.M.S. *Rambler* in 1888, their tops were about 15 feet above high water.

The island and cay are connected by a line of shallow patches; nearly midway between is a reef about 7 cables in diameter, covered at high tide. Elsewhere on the northern edge of the bank there is a depth of not less than 4 fathoms, and vessels may safely anchor in 7 to 10 fathoms about midway between the sand cay and the reef last described.

**Petley reef**, an oval-shaped patch about a mile in extent, forms the extremity of a ledge of coral,  $1\frac{1}{4}$  miles wide, projecting nearly 5 miles in a northerly direction from the north side of the bank, and with irregular depths; no bottom could be obtained with 100 fathoms at a short distance on either side of the ledge.

**Eldad reef** forms the eastern extreme of Tizard bank. It is  $4\frac{1}{2}$  miles in length, from a cable to nearly a mile in breadth, and steep to on its north and south sides; a ridge, about one mile in length, extends north-eastward of the reef, with depths increasing from 8 to 45 fathoms, beyond which it drops sharply to 100 fathoms and more. A few large rocks on Eldad reef are always visible, and at low water many smaller ones uncover.

**Nam yit island** (*Lat. 10° 12' N., Long. 114° 21½' E.*), on the south side of Tizard bank, is 3 cables in length by one cable in breadth, and surrounded by a reef which projects more than a mile to the westward, and about a third of a mile in other directions. It is about 20 feet in height and covered with small trees and bushes.

**Gaven reefs**, two in number, form the south-west extreme of Tizard bank; they are each about one mile in extent, covered at high water and about  $2\frac{1}{2}$  miles apart, with coral heads between.

**Anchorage.—Directions.**—The above comprise the whole of the shallow dangers found on Tizard bank, and with the exception of a 3-fathoms patch, about a mile north-east of Nam yit, nothing less than 4 fathoms was discovered on any of the shoal patches surrounding the lagoon. Vessels of moderate draught can, therefore, in cases of necessity and in fine weather, find convenient anchorage, observing always due care and caution in approaching them, so as to guard against possible danger from some shoal spot having escaped detection by the lead.

*General charts 2660b, 1263.*

*Plan on 1201. Var. 2° 0' E.*

**LOAI TA BANK** extends 21 miles in a north-east and south-west direction, and is 7 miles wide near its middle, tapering towards the ends.

**Loai ta island** (*Lat. 10° 41' N., Long. 114° 25' E.*) lies 10° true distant 18 miles from Itu Aba island on Tizard bank. It is a sand cay,  $1\frac{1}{2}$  cables in diameter, covered with bushes, and surrounded by a reef extending in some places nearly half a mile.

A reef,  $1\frac{1}{2}$  miles in extent, dry at low water, with a sand cay near the centre, lies 5 miles north-westward of Loai ta island. Another reef  $1\frac{1}{2}$  miles in extent, lies three-quarters of a mile to the south-westward of the one just mentioned. Not less than 4 fathoms was found anywhere on the northern edge of Loai ta bank.

**Lan kiam cay and adjacent reefs.**—A coral patch, half a mile in extent, partly dry at low water, lies 75° true distant 2 miles from Loai ta island; and 67° true, distant  $6\frac{3}{4}$  miles from the same island, is a reef three-quarters of a mile in diameter, having a sand cay near its centre, known to the Hainan fishermen as Lan kiam.

At 3 and  $4\frac{1}{2}$  miles north-eastward from Lan kiam are two coral reefs which dry at low water, forming the south-eastern extreme of Loai ta bank; no shallow reefs were found northward of these, though they may exist, the least depth being 6 fathoms near the northern end.

**THI TU ISLAND and REEFS** consist of several dangerous patches upon two coral banks, 12 miles in length, separated by a narrow and deep channel.

**Thi tu** (*Lat. 11° 3' N., Long. 114° 16½' E.*) is a low sand island, about 4 cables in length, situated on the reef which forms the eastern extreme of the western bank. There are a few cocoanut and plantain trees near a small well.

**Banks.**—The western bank is 7 miles in length, with a maximum breadth of  $3\frac{1}{4}$  miles; its north side is marked by a round coral reef, three-quarters of a mile in diameter, between which and the island reef are depths of  $2\frac{1}{2}$  to 6 fathoms.

A sand cay lies on the north-west edge of the bank, on a reef dry at low water and about  $1\frac{1}{2}$  miles in extent; between it and the western extreme of the bank are reefs, nearly always marked by breakers. There is a passage into the lagoon between the sand cay reef and the reef eastward of it, with depths of 5 fathoms.

The south extreme of the bank is marked by a small reef, situated 2 miles south-westward of the island.

The south side of the bank is not nearly so dangerous as the north side, and vessels may anchor upon it, with the sand cay on the north-

*General charts 2660b, 1263.*

*Plan on 1201. Var. 2° 0' E.*

west side bearing between 36° true and 328° true; or to the eastward of the small reef on its south extreme, where there is not less than 4 fathoms. In the lagoon the depths are as much as 19 fathoms.

The eastern bank is a mass of reefs and patches  $4\frac{1}{2}$  miles in length, with a breadth of 2 miles; its western extreme is about 7 cables eastward of Thi tu island reef.

**Subi reef** (*Lat. 10° 54' N., Long. 114° 7' E.*), the north end of which lies south-westward  $12\frac{1}{2}$  miles from Thi tu island, is an irregular-shaped coral reef,  $3\frac{1}{2}$  miles in length by 2 miles in breadth, dry at low water, and has a lagoon, into which there appears to be no passage; it usually breaks and is apparently steep-to.

**NORTH DANGER REEF**, of coral formation, is about  $8\frac{1}{2}$  miles in length, north-east and south-west,  $4\frac{1}{2}$  miles in breadth, and situated from 20 to 28 miles northward of Thi tu islands.

On its north-west side are two sand cays, each about half a mile in length; north-east cay, the northern one (*Lat. 11° 28' N., Long. 114° 21' E.*), is 10 feet high, and the southern 15 feet. Between the cays is a passage one mile wide, with depths of about 5 fathoms leading into the lagoon of the reef, where the depth is from 20 to 27 fathoms.

Shallow water exists all round the edge of North Danger reef, and there are heavy breakers over the coral, awash at its north-east and south-west extremes. No bottom could be obtained close to the edge of the reef with upwards of 100 fathoms of line.

Both cays are covered with coarse grass, and on the north-eastern of the two is a stunted tree. The cays are frequented by Chinese fishermen from Hainan, who collect bêche-de-mer, turtle shell, &c., and supply themselves with water from a well in the centre of the north-eastern cay.

*Chart 2660b. Var. 1° 40' E.*

**Trident shoal**, lying 16 miles eastward of North Danger, is composed of coral, and is  $7\frac{1}{2}$  miles in length by 6 miles in breadth; there are many patches on this shoal with less than 10 fathoms water over them, two of which are very shallow. The patches lie around the edge of the shoal, forming a lagoon, the depths in which are 20 to 35 fathoms; close outside the shoal there is no bottom at 100 fathoms.

The shallowest patch, situated at the northern extreme of the shoal, is about 2 miles in length, east and west, having near its centre (*Lat. 11° 31' N., Long. 114° 39' E.*) a spot which dries at low water springs; the depths on other parts of the patch vary from one to 5 fathoms. Another shallow patch lies at the eastern extreme, with a

*General chart 1263.*

*Chart 2660b. Var. 1° 40' E.*

least depth of  $2\frac{1}{2}$  fathoms. A depth of 4 fathoms was found on a head about a mile south-westward of the northern patch, but not less than 5 fathoms on any of the other patches.

**Lys shoal**, about 5 miles in length, lies 2 miles southward of Trident shoal, and like the latter is formed of a number of patches under 10 fathoms, with a lagoon in the centre. A spot of  $2\frac{3}{4}$  fathoms was found, near the south-west extreme of the bank. Some 5-fathoms patches exist near the north-east end of the bank, but nothing under 6 fathoms was discovered elsewhere; the bank is steep-to.

**Reported reef.**—A reef on which the ss. *Kasenga*, drawing 16 feet of water, touched, is reported (1910) in lat.  $11^{\circ} 50' N.$ , long.  $114^{\circ} 37' E.$ , about  $26\frac{1}{2}$  miles  $39^{\circ}$  true of North-east cay, North Danger reef.

#### WESTERN SIDE OF MAIN ROUTE.—ISLANDS AND DANGERS.

**Charlotte bank**, in lat.  $7^{\circ} 8' N.$ , long.  $107^{\circ} 35' E.$ , is the first bank met with on the western side of the main route northward of the Anamba islands. It has a least depth of 5 fathoms, with from 32 to 40 fathoms around it, and is about 4 miles in length, east and west, by 2 miles in breadth.

Vanguard bank, the first danger on the eastern side, is described on page 90.

**Scawfell shoal**, originally reported in 1865 as a patch of  $7\frac{1}{2}$  fathoms, practically in the position since found to be in, has a least depth of 5 fathoms, coral, near its centre; it is half a mile in length, east and west, by a quarter of a mile in breadth, within the 10-fathoms contour line, and situated in lat.  $7^{\circ} 18' N.$ , long.  $106^{\circ} 51' E.$  The shoal at the time of examination by the *Waterwitch* in 1908 was not marked by discoloured water nor by overfalls.

*Chart 1000, Pulo Condore group. Var. 2° E.*

**PULO CONDORE GROUP**, known as Cannon by the Cochinese, consists of about a dozen islands, situated about 45 miles from the coast of Cambodia, in the track of vessels proceeding between Singapore and Saigon river; their north extremity is distant 97 miles from Cape St. James, at the entrance to that river.

The principal island (*Lat.  $8^{\circ} 41' N.$ , Long.  $106^{\circ} 36' E.$* ) is nearly 9 miles in length, north-east and south-west, from 2 to 4 miles in breadth, and is formed of a ridge of mountains the summit being flat-topped and 1,954 feet above high water. The eastern side is divided into two bays by a rocky peninsula, the northern of which is com-

*General charts 2660a, 2414.*

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*Chart 1000, Pulo Condore group. Var. 2° E.*

pletely open to the eastward; on the western side is South-west bay. Pulo Condore is encompassed by several smaller islands, which are mostly high and covered with trees, the highest attaining an elevation of 1,076 feet. The peak on Little Condore, 4 cables westward of the Gullet, forms an excellent landmark from the southward or westward. *See view on the plan.*

**Settlement.—Supplies.**—The French have established a fortified post and a penal settlement at the village in Great or East bay. A small pier fronts the village. The island is but thinly populated, but it furnishes plenty of fruits and abounds with timber. The natives rear a quantity of poultry and pigs. Water is procurable in South-west bay, southward of the landing place.

**Telegraph.**—Pulo Condore is connected with Cape St. James by submarine cable.

**Communication.**—The Messageries Maritime, Singapore to Saigon, steamers call here, also the Saigon-Bangkok line, giving communication with Saigon, weekly.

**GREAT or EAST BAY** is formed by the projection from the main body of the island of two high points of land, which are about 4 miles apart. It is only available during the south-west monsoon period.

**Islets.**—Off the southern point, four islets, fringed with coral, extend nearly  $1\frac{1}{2}$  miles, and off East point is Hon Bai Kan, an island nearly 3 miles in length and 1,076 feet in height, also fringed with coral. Hon Lap, a small islet, lies off its south side. Hon Kao, about a mile in extent and 797 feet in height, lies about 2 miles north-eastward of Bai Kan.

**LIGHT** (*Lat. 8° 40' N., Long. 106° 42' E.*).—From a rectangular white lighthouse, with red roof, erected on the east end of Hon Bai Kan, is exhibited at an elevation of 696 feet above the sea, a *fixed white* light visible when bearing from 57° true, through north and west, to 154° true, except where obscured by Hon Kao, between 224° true and 240° true; it can be seen in clear weather from a distance of 25 to 30 miles.

**Dangers.**—East bay, inside a line connecting its northern and southern points, is encumbered with an extensive shore flat, and many detached shallow patches, on account of which vessels should not go inside that line except at the south-west part of the bay, where the least-known depths are  $3\frac{1}{2}$  and  $3\frac{1}{2}$  fathoms.

The main entrance to the bay is barred by a flat which extends right across from Hon Gué to Hon Bai Kan, with depths under 5 fathoms and several patches of 2 to 3 fathoms, as shown on the plan.

*General charts 2660a, 2414.*

*Chart 1000, Pulo Condore group. Var. 2° E.*

In the deep-water anchorage between this bar and the shallows off the head of the bay is a patch of  $2\frac{3}{4}$  fathoms, steep-to, with White rock in line with East point, bearing  $36^\circ$  true, the latter distant  $1\frac{3}{4}$  miles. Patches of 4 to 5 fathoms are charted in the southern part of the deep water, and others may exist as the bay has not been thoroughly examined.

**Landmark.**—A rock, nearly awash, lies one mile  $176^\circ$  true from the pier at the village, and 4 cables from the western shore, with a remarkable rocky elevation in that direction bearing  $264^\circ$  true.

A whitewashed mark is situated on the shore south-eastward of the remarkable rock, and is a useful mark for making the anchorage.

There are no known dangers in the approach to the Pulo Condore group.

**Directions.**—Great or East bay has three entrances. That from the south-westward between the south point of the bay and Hon Cha is 3 cables wide, and apparently deep, but the water shoals to less than 5 fathoms within the island. *See view on the plan.*

The second, or the channel from the south-eastward, is between Hon Gué and Hon Bai Kan, over the bar which connects the two. The best water, about  $4\frac{1}{2}$  to 5 fathoms, will be found by passing from one to 2 cables north-eastward of Hon Gué, about midway between it and the bank with 2 fathoms water to the eastward.

The passage from the north-eastward, between East point and Hon Bai Kan is two-thirds of a mile wide, and deep, but the soundings are very scant in the approach. When within the entrance, by keeping White rock twice its breadth open of East point, a vessel will pass eastward of the  $2\frac{3}{4}$ -fathoms patch in the fairway; when the remarkable rock situated on the northern slope of the hills on the south side of the bay bears  $263^\circ$  true, or the white mark on the shore  $255^\circ$  true the vessel will be southward of the patch, then steer for the south point of the bay, anchoring as convenient.

If bound to the Inner anchorage, steer in with the remarkable rock bearing  $263^\circ$  true, until the white mark bears  $230^\circ$  true, when bring it ahead, and gradually hauling to the north-westward to avoid the rock on the northern side of the approach.

**Anchorage.**—A good berth for a large vessel (which must enter by the northern channel) appears to be in 6 to 7 fathoms, with the summit of Hon Tai-leung, bearing about  $182^\circ$  true, and Hon Lap  $95^\circ$  true.

*General charts 2660a, 2414.*



*Chart 1000, Pulo Condore group. Var. 2° E.*

During the strength of the south-west monsoon, in order to avoid the sea, vessels of moderate or light draught should anchor farther westward, where, however, the squalls are heavier, but the holding ground is good, the bottom being grey mud. There appears to be good anchorage with depths of  $4\frac{1}{2}$  to  $5\frac{1}{2}$  fathoms, inside the ridge which has  $3\frac{1}{4}$  and  $3\frac{1}{2}$  fathoms patches, with the south point of the bay bearing from  $199^\circ$  true to  $176^\circ$  true, and Hon Lap from  $92^\circ$  true to  $98^\circ$  true.

The Inner anchorage,  $199^\circ$  true about 8 cables from the landing pier, has a depth of  $3\frac{1}{2}$  to 4 fathoms, as charted.

**Tides.**—It is high water, full and change, at Pulo Condore, at 2h. 30m.; springs rise 6 to 8 feet in South-west bay.

**North-east bay** offers convenient shelter in the south-west monsoon for vessels not wishing to enter Great bay. It appears to be free from danger, but the depths decrease sharply within the 5-fathoms line. Vessels should therefore anchor in 7 fathoms, mud, or directly the water shoals under that depth.

**White rock** lies east-north-eastward, distant  $3\frac{4}{10}$  miles from the north-east point of the largest island of the Pulo Condore group; it is apparently high, and there are depths of 17 to 22 fathoms at about half a mile off, but none charted near it.

There is a bank of 8 fathoms 13 miles east-north-eastward of white rock.

**SOUTH-WEST BAY** is formed between the south-west end of the large island and the adjoining high island, Little Condore or Bae Vioung, 708 feet in height, the east point of which is separated from the south-west point of the large island by a narrow channel. The entrance to the bay is about three-quarters of a mile wide, with depths of 7 to 9 fathoms, gravel and mud, decreasing to 5 fathoms near the flat that occupies the head of the harbour, and which is dry at low water for half a mile. This bay is well sheltered by the surrounding hills, except from the north-westward, but the wind is seldom strong from that quarter; the heavy squalls, however, require precaution, but the holding ground is good.

Some islets lie off the north point of this bay, northward of which is a high island named Hon Tap, having some rocks above and below water extending from its north-west side.

Hon Taé, another high island, lies about a mile to the north-westward of Hon Tap; off its north-eastern extreme is an islet. Hon Taé Niao is another island lying a little more than 2 miles north-eastward of Hon Taé, having a reef and some rocks extending about a cable from its north side.

*General chart 1263.*





Pulo Sapata, bearing  $250^{\circ}$  true, about 2 miles.

*Charts 2414 and 2660a.*

**The BROTHERS** are two islets, about 3 miles apart, north-east and south-west, and situated 24 miles westward of the Pulo Condore group. The westernmost, Aride isle (*Lat. 8° 34' N., Long. 106° 6' E.*), is a low barren rock, appearing white from the eastward, and has heavy breakers on its eastern side during strong winds. The easternmost is a round islet, 180 feet in height, covered with vegetation to its summit.

*Chart 2660a.*

**WALLACE BANK** was reported by the Master of the British ship *Wallace* (1885) to be about three-quarters of a mile in extent, with a depth of 8 fathoms, in lat. 9° 32' N., long. 107° 40' E.

*Chart 1261, Saigon river to Kam ranh bay.*

**Royal Bishop bank** (*Lat. 9° 39' N., Long. 108° 15' E.*), composed of coral, is  $3\frac{1}{2}$  miles in length, and about  $1\frac{1}{2}$  miles in breadth, with a depth of 10 fathoms over it, and 28 to 30 fathoms around; there may be less water.

A patch of 8 fathoms is charted in lat. 10° 5' N., long. 108° 2' E.

**PULO SAPATU, or Shoe island** (*Lat. 9° 58' N., Long. 109° 6' E.*), 347 feet high, is the easternmost of three islands, named the Catwicks. It is a barren rock, one-third of a mile in length, and visible in clear weather from a distance of about 22 miles. See view abreast, from which position the Catwicks will be in sight.

When viewed from some directions it resembles a shoe; at others appears as a large square column; and from the eastward as a pyramid. Vessels generally endeavour to sight this island, or to pass within 25 miles of its eastern side, in proceeding up or down the Main route of the China sea.

With the exception of a rock awash, lying a quarter of a cable eastward of its south end, the island is steep-to; depths of 16 and 17 fathoms were found at 2 cables eastward of it, and at half a mile off in that direction 25 to 30 fathoms. On the west side the depths are greater.

**Landing.**—Under very favourable circumstances landing may be effected upon the rocks at the south end of the island; otherwise it is inaccessible. It is frequented by sea birds in the breeding season.

**Julia shoal**, with a depth of  $2\frac{1}{2}$  fathoms, situated 124° true, distant  $3\frac{1}{2}$  miles from Pulo Sapatu, is of coral formation, and about a quarter of a mile in extent.

Pyramid (Little Catwick), well open northward or southward of Pulo Sapatu, leads half a mile or more clear of the shoal. With the Pyramid shut in behind Pulo Sapatu a vessel will be inside the Julia shoal

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam ranh bay. Var. 2° E.*

if the angle of elevation of Pulo Sapatu be  $1^{\circ} 22'$  or upwards, and outside the shoal if the angle of elevation be less than  $0^{\circ} 45'$ .

**The Pyramid, or Little Catwick**, is a pyramidal rock, 56 feet high and steep-to, lying  $2\frac{1}{4}$  miles west-north-westward of Pulo Sapatu.

The channel between this rock and Pulo Sapatu has a depth of about 60 fathoms, but it ought not to be used by a sailing vessel, as the currents are strong and irregular about these islands.

**Round island, or Great Catwick**, is a barren rock 196 feet high, and about 300 yards in diameter, lying west-north-westward  $11\frac{1}{2}$  miles from Sapatu; it has depths of 30 to 50 fathoms at a short distance in all directions.

**La Paix rock** is small, with a pinnacle awash and steep-to, lying in the channel between Round island and Pyramid, the former bearing  $275^{\circ}$  true, about  $4\frac{1}{4}$  miles, and Pulo Sapatu is just open eastward of the Pyramid. Except in fine smooth weather, the sea always breaks upon this rock.

**Yusun shoal** (*Lat.  $10^{\circ} 16' N.$ , Long.  $109^{\circ} 2' E.$* ) is a coral patch of 4 fathoms, in the fairway of the channel between Pulo Cecir de Mer and the Catwicks, with the western hill of the former bearing  $341^{\circ}$  true, distant  $17\frac{1}{2}$  miles. Close around it are depths of 45 to 50 fathoms, which is the general depth of the middle of the channel, but about  $1\frac{1}{2}$  miles west-north-west of the shoal are depths of 23 and 27 fathoms. In fine weather the shoal is not easily seen, but in the strength of the monsoons the sea has been frequently observed to break upon it.

There is reason to believe that the Yusun is the only danger in the channel between Cecir de Mer and the Catwicks, which is otherwise spacious and safe. The depths in the channel are few and irregular, and will be better understood by a reference to the chart.

**PULO CECIR DE MER** is  $3\frac{1}{2}$  miles in length north and south, and  $1\frac{1}{2}$  miles in breadth, with two hills towards its north end. The south-west hill, in *lat.*  $10^{\circ} 32\frac{1}{2}' N.$ , *long.*  $108\frac{1}{2}^{\circ} 56\frac{1}{2}' E.$ , has a round top, is 360 feet in height, and is visible in clear weather from a distance of about 25 miles. The north-east hill, 300 feet high, is conical, and has several masses of rock near its summit, which give it a jagged appearance.

**No supplies.**—Pulo Cecir de Mer is inhabited by poor fishermen and others, and is well cultivated, but no supplies can be obtained.

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam ranh bay. Var. 2° E.*

**Islets and reefs.**—Nearly half a mile off the north-east end of the island are several rocks, one 60 feet high, on the edge of the shore reef. Nearly a mile off the north end is a patch of 5 fathoms.

On the east side is a sandy bay, fronted by a coral reef to the distance of a mile or more; the reef is steep-to. At half a mile off the south end is an islet 132 feet in height, with a black rock beyond 30 feet in height. The reef which fronts the bay encircles these islets, and extends about 3 cables south-eastward of the last-mentioned with rocks awash. The reef skirts the western shore at about a third of a mile, and is also steep-to.

**Anchorage.**—In seeking anchorage, it must be borne in mind that the reef surrounding the island is steep-to. There is fair anchorage during the north-east monsoon period off the sandy shore forming the south-west and west sides of the island, in depths of 13 to 16 fathoms, sand and shells; but the best position is just southward of the south-west point, where vessels may conveniently anchor in 10 to 14 fathoms, at half a mile from the shore reef, which is steep-to.

It is possible to obtain shelter in a steam vessel from the south-west monsoon by anchoring off the north-east end in 14 or 15 fathoms; but the bottom is rocky, bad holding ground, and by no means to be recommended as an anchorage.

**High rock**, 50 feet high, and the resort of sea birds, lies nearly 5 miles north-westward of Cecir de Mer; half a cable northward of it is a rock a few feet high, with a rock awash beyond it.

In the channel between Cecir de Mer and High rock the depths vary from 9 to 12 fathoms, coral. Near the rock are patches of 6 and 7 fathoms.

The channel between High rock and Holland bank is about 9 miles wide, with depths varying from 7 to 10 fathoms on the patches, and to 15 to 20 fathoms between them; bottom generally sand, or sand and shells at the greater depths, and rocky on the patches.

**HOLLAND BANK** is composed of coral, and within the depth of 19 fathoms is  $6\frac{1}{2}$  miles in length by 4 miles in breadth. The shoalest patches are in its eastern half, and cover a space of about  $2\frac{1}{2}$  miles, with an irregular bottom; the least depth found was  $2\frac{1}{2}$  fathoms, in lat.  $10^{\circ} 39\frac{1}{2}'$  N., long.  $108^{\circ} 42\frac{1}{2}'$  E.

The depths around the bank are very irregular, and afford no certain guide, but the bank is much steeper on its eastern edge than elsewhere. The lead, however, is not to be relied on in approaching that edge, for 20 fathoms may be obtained at one cast, and about 4 fathoms at the next. Vessels should pass westward of the bank.

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam ranh bay. Var. 2° E.*

**Clearing marks.**—Vessels passing northward of the bank should not bring the south-west hill of Cecir de Mer eastward of  $131^{\circ}$  true; and those passing southward of the bank should not bring the same hill to the southward of  $103^{\circ}$  true.

The dangers to the westward of Holland bank are described with the mainland in Chapter V.

**Marne bank** is charted  $252^{\circ}$  true, distant 23 miles from the summit of Pulo Cecir de Mer, and is  $3\frac{1}{2}$  miles in extent east and west with a depth of 9 fathoms over it. Has not been examined.

*Chart 2660a.*

**Juniata bank.**—The U.S.S. *Juniata*, 1888, reported having obtained soundings in 30 fathoms, fine grey sand, in a position about 40 miles eastward of Pulo Cecir de Mer (*Lat.*  $10^{\circ}32'N.$ , *Long.*  $109^{\circ}38'E.$ ).

**Minerva bank**, with 28 fathoms, the locality of which is doubtful, is said to lie near the Main track (*Lat.*  $10^{\circ}38'N.$ , *Long.*  $110^{\circ}19'E.$ ).

Search was made in the *Rifleman* on and near the supposed position of this bank, but no bottom was obtained with 200 fathoms; as a thorough examination was not made, it may, however, exist somewhere near its assigned position. H.M.S. *Sirius*, 1904, sounded near this spot, obtaining no bottom at 95 fathoms. See Kiev bank, below.

**Reported bank.**—The Commander of the ss. *Kiev*, of the Russian Volunteer Fleet, reported in 1908 as having sounded on a bank with about 39 fathoms, apparently in *lat.*  $10^{\circ}15\frac{3}{4}'N.$ , *long.*  $110^{\circ}13\frac{1}{4}'E.$ ; also that in the year 1901 he obtained a sounding of 34 fathoms in about *lat.*  $10^{\circ}10'N.$ , *long.*  $110^{\circ}10'E.$

H.M. surveying vessel *Waterwitch* again unsuccessfully searched for this bank in 1912.

## PARACEL ISLANDS AND REEFS.

*Chart 94, Paracel islands. Var. 1° 20' E.*

**General remarks.**—The description of these islands and reefs is principally from the German Government surveys, executed between the years 1881-1884.

**The Paracel islands and reefs** are an extensive group of low coral islands and reefs, lying between *lat.*  $15^{\circ}46'N.$ , and  $17^{\circ}5'N.$ , *long.*  $111^{\circ}13'E.$  and  $112^{\circ}47'E.$  They consist of two principal groups, the Amphitrite and Crescent, and several reefs and islets. They were annexed by the Chinese Government in 1909.

In fine weather and a clear atmosphere there is no difficulty in navigating between the reefs of the Paracel groups with a lookout aloft, as the trees on the several islands, the heads of rock above water on some of the reefs, and the sea breaking over most of them, give warning of approach to the dangers. In misty or bad weather they

*General charts 2660a, 1263.*

*Chart 94, Paracel islands. Var. 1° 20' E.*

should be avoided, and there seems nothing to be gained in passing between them unless seeking anchorage. Sailing vessels should avoid these dangers at all times, for during calms they may be drifted on to the reefs, close to which there is no anchorage. Many wrecks occur here.

The anchorages are mostly open, affording shelter, only with the wind off the islands; these are mentioned with the several islands.

**Tides and currents.**—At the Crescent group it is high water, full and change, at about 10h. 30m., springs rise 3 feet (*see* remarks on tides, pages 40, 41. The current runs generally with the wind in both monsoons, but in light winds between the monsoons they are continually changing their direction among the reefs, and sometimes attain the rate of 2 miles an hour.

**Triton island** (*Lat. 15° 46½' N., Long. 111° 14½' E.*), the south-westernmost of the Paracels, is a sand cay, about 3 feet high and a little more than a mile in length; it stands on a coral reef, which extends about 1½ miles northward and north-eastward, and to about half a mile in other directions. The reef has not more than 6 feet water over it, and is steep-to.

This island is the breeding-place of sea birds.

**Passu Keah**, situated about 37 miles east-north-eastward from Triton island, is a sand cay situated on the west end of a coral reef, which is 5 miles in length in an east and west direction and steep-to.

**Discovery reef**, about 9 miles northward of Passu Keah, is 16 miles in length in an east and west direction by about 5 miles in breadth, and is steep-to, with several rocks a few feet above water; there is barely a depth of 2 fathoms over any part of it. There is a large opening on its south side into the lagoon, and a smaller one on its north side, used by the Chinese fishing boats; the overfalls are very heavy on the reef.

**Vuladdore reef**, lying 6 miles north-eastward of Discovery reef, is 7 miles in extent, east and west, 2½ miles in breadth, and steep-to. It has a few small rocks on it above water, with high breakers at times.

**Bombay reef** forms the south-east corner of the Paracels group; it is of oblong form, 13 miles in length, east and west, enclosing a lagoon; some of the rocks on its edge are awash, and four of them are above high water. The reef is steep-to, and breaks. Eastern extreme lies in *lat. 16° 5' N., long. 112° 38' E.*

In December, 1904, H.M.S. *Rinaldo* observed two wrecks on the south-east side of Bombay reef, and a third near the centre of its

• *General charts 2660a, 2661a.*



*Chart 94, Paracel islands. Var. 1° 20' E.*

northern side. The easternmost of these wrecks had her two masts and funnel standing, which formed a good mark.

In March, 1909, H.M.S. *Andromeda* observed only one wreck, namely, on the south-east side; the masts and funnel had disappeared, and probably the remains would soon disperse, as the vessel appeared broken in two.

**Bremen bank** is situated about 12 miles northward of Bombay reef, and is 12 miles in length within a depth of 20 fathoms; the shoalest water found is 7 fathoms at the south-west part of the bank.

**Jehangire bank**, about 6 miles in length, consists of three detached patches lying about 5 miles east-north-eastward of the Bremen. The depths on the bank are very irregular; 7 fathoms is the least known depth, and it is situated at the south-west extreme of the southern one.

**LINCOLN ISLAND** (*Lat. 16° 40' N., Long. 112° 44' E.*), the eastern of the Paracel islands, is  $1\frac{1}{4}$  miles in length, a little more than half a mile wide, and about 15 feet high, the north-east side being cliffy. It is covered with trees and brushwood, and surrounded by a coral reef, dry at low water, which extends from one to 3 cables. One of the cocoanut trees is said to form a good landmark.

The position of the observation spot (marked by a post) on the west side of Lincoln island, was determined by the officers of the German Government survey in 1883, as in *lat. 16° 40' N., long. 112° 43½' E.*

A narrow coral shoal projecting southward from its south-east point, is said to extend 11 miles, and to be studded with rocks, but judging from the soundings that were obtained by the surveying vessel *Rifleman*, the dangerous part of the shoal does not extend more than 3 miles from the island; time did not admit of its being further examined. None of it should be crossed. Depths of less than 10 fathoms extend about one mile north-west of the island.

On the north and east sides of the island the depths increase rapidly, but towards the south and south-west, depths under 40 fathoms were obtained for nearly 20 miles.

**Anchorage.**—Good anchorage can be obtained in the north-east monsoon under the lee of the island, in a depth of 10 fathoms, coral, about half a mile from the shore. An anchor is charted on the north side of the island, where possibly some shelter may be found in the opposite monsoon. In the centre of the island, close to a stunted cocoanut tree, there is a well, dug by the Chinese fishermen, into which the water filters.

**Pyramid rock**, a small cone-shaped rock, 17 feet high, lies  $7\frac{1}{4}$  miles south-westward from Lincoln island; at a distance it might be mistaken for a junk.

*General charts 2661a, 1263.*

*Chart 94, Paracel islands. Var. 1° 20' E.*

**Dido bank**, discovered by H.M.S. *Dido*, in 1844, is a small bank with 13 fathoms, sand, with 80 fathoms and greater depths around it; it lies 50° true, distant  $12\frac{1}{2}$  miles from the north end of Lincoln island.

**The AMPHITRITE GROUP** is the north-easternmost of the Paracels; the two portions of the group, lying north and south of each other, are separated by a deep-water channel, 4 miles wide.

**The Northern group** consists of two reefs separated by Zappe pass. The westernmost of these reefs is 6 miles in length by  $1\frac{1}{2}$  miles in breadth, with a sand cay near its west end, and Tree island 2 miles within its east end. The northern and eastern sides of these reefs are steep-to, but on the south and west sides depths of 5 to 20 fathoms will be found at a short distance from the reef; at the south-west corner of this group the 10-fathoms line is a mile from the reef.

**Tree island.—Anchorages.**—Tree island (*Lat. 16° 59' N., Long. 112° 17' E.*), covered with mangrove bushes, and surrounded by a white sand beach, may be recognised by the palm tree (30 feet high) near its centre. It is much frequented by Chinese fishermen, the south-west side of the island affording sheltered anchorage in the north-east monsoon period close to it for junks, in 13 feet water. The channel leading to this anchorage is on the south side of the reef, and is 2 cables wide with a depth of 4 to 6 feet at low water. Under North and Middle islands there is anchorage in from 11 to 16 fathoms, sand.

The south-eastern reef of this group, on which there are three islands covered with mangrove bushes, is 4 miles in length north-west and south-east, and has three sand cays near its south end; vegetation is increasing on these cays.

Landing can be effected in the openings on the south side of this reef between the islets and cays.

**Zappe pass** is about half a mile wide between the reef on either side, with a least known depth of  $2\frac{1}{2}$  fathoms in mid-channel; it is only available for small craft during smooth water. With a fresh breeze the breakers extend right across; there is usually a strong current through it.

**The Southern group** consists of Woody and Rocky islands lying near each other and on the same surrounding reef.

*Plan on chart 94.*

**Woody island** (*Lat. 16° 50' N., Long. 112° 21' E.*), the southern and largest island of the group, is about one mile in length, surrounded by a white sand beach, and covered with trees; landing can be effected on the lee side.

*General charts 2661a, 1263.*

*Plan on 94. Var. 1° 20' E.*

Rocky islet, north-east of Woody island, and on the same reef, is from 40 to 50 feet high.

The reef surrounding these islands extends to a distance of 3 cables in places, and dries at low water. There are depths of 16 to 30 fathoms at a distance of one mile from the north, west, and south-west sides of Woody island reef, decreasing to 8 or 9 fathoms close-to; and a bank, having 3 to 10 fathoms, extends upwards of 3 miles in a south-easterly direction from this reef, steep-to, on its eastern side.

**Anchorage.**—During southerly winds, good anchorage may be obtained in 13 fathoms, sand, about half a mile north of Woody island reef. With north-easterly winds there is good anchorage in 18 to 20 fathoms, sand, about a quarter of a mile from the south-west side of the reef. The bottom, for 5 miles seaward of this anchorage, is tolerably even, with depths of 27 to 30 fathoms.

*Chart 94, Paracel islands.*

**Ititis bank**, 3 miles in length and  $1\frac{1}{2}$  miles in breadth, with depths of 8 to 10 fathoms and fairly steep-to, lies 7 miles  $238^\circ$  true from Woody island.

**The CRESCENT GROUP** of islands and reefs, consist of six low sand islands, for the most part connected by reefs, stretching nearly east and west in the form of a crescent; on the south-eastern horn of the crescent is Drummond island, and on an isolated reef westward of it the two Duncan islands with an opening  $5\frac{1}{2}$  miles wide between its reef and the Antelope reef, which lies about 2 miles eastward of Money, the western island of the group. This opening, with a patch of 5 fathoms charted in the fairway, is on the south side of the chain; within the crescent are irregular depths of 20 to 40 fathoms with coral heads in places.

**Anchorage.**—The best anchorage is near to the reef, on the north side of Duncan islands, in 10 to 15 fathoms, where there are some broad patches of sandy bottom. The Chinese fishing boats anchor on the reef between the two islands, where there are depths of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  fathoms (*Lat.  $16^\circ 28' N.$ , Long.  $111^\circ 44' E.$* ).

**Duncan islands**, of coral, and covered with shrubs, are surrounded by a reef extending about  $1\frac{1}{4}$  miles east and west, with a breadth of two-thirds of a mile, and steep-to. The eastern and larger island, with trees about 20 feet high, and half a mile in length, has on its south side a well, near two cocoanut palms. There is a white flag-staff on the north-east end of the island about 10 feet higher than the trees. (*Flora*, 1909.) The bushes on the western island are about 10 feet high, and there is a cocoanut palm near its centre, forming a good landmark.

*General charts 2661a, 1263.*

*Chart 94, Paracel islands. Var. 1° 20' E.*

**Drummond island**, about half a mile in length, with a breadth of  $2\frac{1}{2}$  cables, is covered with brushwood and mangrove trees about 15 feet in height, with a higher palm near the centre. It is separated from the Duncan islands by a channel  $1\frac{1}{2}$  miles wide. In using this channel vessels should pass the Duncan islands at a distance of a quarter to half a mile; there is anchorage close westward of Drummond island reef.

**Cays.**—Observation bank is situated at the north extreme of the Crescent group; there are several sand cays from 3 to 10 feet high, on the reef between it and Drummond island; the one on Observation bank (and possibly others) is covered with brushwood.

**Pattle island**, on the north-west side of the group, is 5 cables in length,  $2\frac{1}{2}$  cables in breadth and about 30 feet high; on the south side there is a bight where a boat may land, but not easily, at low water, as there are stones near the shore. The island is covered with brushwood and mangroves from 10 to 15 feet high, and at about one-third its length from the western end are three cocoanut palms, the top of the highest being about 40 feet above the sea, forming a good landmark.

The reef surrounding the island extends  $1\frac{3}{4}$  miles north-eastward of it, and has a rock above water on its edge, about 2 cables northward of Pattle. On either side of this reef there is a clear channel.

H.M.S. *Flora*, in October, 1909, took off the crew of the *Ragnai*, wrecked here a few days previously.

**Water** was obtained by the crew of the *Ragnai* by digging near the palms; it required boiling to render it more palatable.

**Robert island**, oval in shape, and 26 feet high, is nearly 4 cables in length; it is covered with vegetation and has a well of water. A reef surrounds the island, but there is landing on the eastern side.

**Money island** is situated on the west side of a reef 3 miles in extent and steep-to; it is 7 cables in length, about 20 feet in height, and covered with brushwood. Several sand cays lie eastward of it on the same reef.

The tidal streams run parallel to the edges of the reef at the rate of  $2\frac{1}{2}$  knots an hour at times.

**Antelope reef**, lying eastward of Money island, is 3 miles in length by 2 miles in breadth, and partly dry at low water, with a cay on its south-east extreme.

**NORTH REEF**, the north-western danger of the Paracels, is about 6 miles in length, east and west, 3 miles in breadth, and steep-to in most places. The edge of the reef all round has rocks just above water, and the noise of the breakers over the reef may be heard from some distance at times. The remains of three vessels were visible on

*General charts 2661b, 1263.*

*Chart 94, Paracel islands. Var. 1° 20' E.*

this reef in 1910 from a distance of 6 or 7 miles. On the south-west side is a boat passage into the lagoon. The west extreme of the reef is in *lat. 17° 2½' N., long. 111° 29' E.*

**Hotspur shoal**, on which an American ship of this name was said to have been wrecked in 1860, is charted in *lat. 16° 50' N., long. 111° 30' E.*; it was probably the North reef that this vessel struck upon; was not seen by *H.M.S. Linnet* when here in 1893.

*Chart 270, Macclesfield bank.*

**MACCLESFIELD BANK**, discovered by the English ship of that name in 1701, lies between *lat. 15° 24' N. and 16° 15' N., and long. 113° 40' E. to 114° 57' E.*

Reports of shallow water on the edge of this bank caused its partial survey by *H.M.S. Penguin* in 1892 and *Egeria* in 1892-3. A previous partial survey showed that this coral bank rose rapidly out of deep water, was about 75 miles in length in a north-easterly and opposite direction, with an extreme breadth of 33 miles, and that it was a submerged atoll, with a general depth of about 40 fathoms over a large part of its area, and with distinct indications of a shallow rim surrounding this area. The general result of the whole examination may be stated to be that on the whole of the 200 miles forming the periphery of the bank there exists a coral rim about 3 miles wide of luxurious growth and at a remarkably even depth below the surface of from 7 to 14 fathoms; this rim being broken here and there by passages of greater depth, but less than the general depths of from 40 to 50 fathoms, which prevail over the central portion of the bank.

On one spot only of the rim (near its north-east end on Pigmy shoal) was a depth of as little as 6½ fathoms found, and on a patch in the centre of the lagoon a small spot of 5 fathoms (Walker shoal) was the shoalest water found. Banks under 10 fathoms have been given the names of surveying officers chiefly, as on plan. The western portion has only been partially surveyed.

The depth of the surrounding ocean is about 1,300 fathoms, the bottom globigerina ooze; the south face of the bank is almost perpendicular to 600 fathoms, the west is very steep, but the north face slopes gradually from 60 fathoms, close to the rim, to 200 fathoms at 10 miles northward.

**CAUTION.**—The bank may generally be seen from aloft on approaching by the greenish colour of the water. In heavy weather the sea on its edge is high and confused. As it is quite possible that shallow coral heads may exist in the unsurveyed portion, and that others may have escaped the lead in the part which has been more fully examined, it is recommended that vessels should pass either eastward or westward of Macclesfield bank, and not over it.

*General charts 2661a, 2661b, and 1263.*

*Charts 2661a and b.*

**SHOALS.**—**Helen shoal** (*Lat. 19° 12' N., Long. 113° 53' E.*), between Macclesfield bank and Hong Kong, is 2 miles in length, east and west, and one mile in breadth. The least water found is  $6\frac{1}{2}$  fathoms, the general depths being 8 and 9 fathoms, with no bottom at 100 fathoms close around.

*Chart 2661a.*

**St. Esprit shoal** (*Lat. 19° 33' N., Long. 113° 2' E.*), about 55 miles west-north-westward of Helen shoal, of coral formation, is about 2 miles in length, east and west, and one mile in breadth. The general depths on this shoal are 9 fathoms, the least water obtained being 7 fathoms, with from 60 to 80 fathoms at a short distance.

**Current.**—Strong tide-rips were observed in the vicinity of St. Esprit and Helen shoals, but on examination deep water was found to exist. The current was found to set generally with the wind.

**Alacrity bank.**—Soundings of 11 and 14 fathoms, respectively, were reported to have been obtained, over rocky bottom, by H.M.S. *Alacrity* in 1906, when about 70 miles eastward of Hainan island, in approximately *lat. 19° 28' N., long. 112° 18' E.*

This bank was unsuccessfully searched for by H.M.S. *Merlin* in 1908.

*Chart 362, Pratas reef and island.*

**PRATAS REEF and ISLAND.**—**Pratas island** (*Lat. 20° 42' N., Long. 116° 43' E.*) is situated on the west side, on the middle of the sunken part of Pratas reef. It is about  $1\frac{1}{2}$  miles in length, east and west, half a mile in breadth, and 40 feet in height, of which elevation the bushes, with which it is covered, form about 10 feet. It is visible from a distance of about 12 miles in clear weather. (Described also in Vol. IV.) In the hazy weather, which generally prevails during the north-east monsoon, the island is seldom visible beyond 5 or 6 miles, and the breakers at the edge of the reef may possibly not be seen until within one mile of them.

The island is composed of sand, and its shape is that of a horse-shoe; the two prongs, extending westward from the main portion, enclose a shallow inlet about a mile in length from the bar at its entrance to the settlement at its north-east arm; it affords shelter to the Chinese fishing craft which come here in the early part of the year. Coral reef, dry at low water, extends 4 cables westward of the entrance, at which distance its edge trends north and south. Shoal patches exist for a distance of  $1\frac{1}{2}$  miles north, and  $2\frac{1}{2}$  miles south, of the island, with North and South channels beyond. (See the amended plan.) Brackish water can be obtained near the settlement by digging a few feet into the sand. Sea birds are numerous in the breeding season.

Surveying beacons were erected during the survey, February to May, 1911, by Deputy Coast Inspector Eldridge, and they will probably remain some time.

*General charts 2661b, 1263.*

*Chart 362, Patras reef and island. Var. nil.*

**Pratas reef**, the north-east point of which (*Lat.*  $20^{\circ} 46\frac{1}{2}'$  *N.*, *Long.*  $116^{\circ} 53'$  *E.*) is over 10 miles from the island, is a coral barrier of circular form, enclosing a lagoon with 5 to 10 fathoms water, thickly studded with coral knolls round its margin, but comparatively clear near the middle. The reef is about 40 miles in circumference, and one to 2 miles in breadth. The north, east, and south sides are just dry at low water springs and steep-to; the western side forms a sunken barrier, across which are two channels leading into the lagoon, one on each side of Pratas island.

The North channel lies between the island and the edge of the breakers, and a depth of about 3 fathoms may be carried near the middle of it at low water springs, but it is encumbered with patches with as little as 2 feet in places. The South channel is by far the better of the two, being wider and a little deeper, and is less encumbered with coral knolls; this channel is apparently available for vessels of 15 feet draught; great caution, however, is required, and the vessel should be coned from aloft, having, if possible, the sun astern or abaft the beam.

**Tides.**—It is high water, full and change, at about 9h. 28m.; with a spring rise of about 5 feet.

**Anchorage.**—Although Pratas reef is steep-to in most parts, there are several spots where, in case of necessity, a vessel might find anchorage outside the breakers; particularly on the west side, abreast the middle of the North and South channels over the sunken part of the reef, and at the distance of about 2 and  $2\frac{1}{2}$  miles, respectively, on either side of the island. At each of these spots there is good anchorage in the north-east monsoon, in 20 to 10 fathoms, but the position abreast the South channel is considered the better of the two, the sunken reef at this part being deeper and the bottom more even than in the channel north of the island. There is anchorage in about 20 fathoms, coral and clay, at about one mile westward of the west end of the island. A vessel of light draught might even anchor in safety on the reef in the middle of the South channel entrance, in  $3\frac{1}{2}$  fathoms at low water, or cross it and take up a berth inside the lagoon in 10 fathoms, fine sand.

An anchorage is shown on the new survey in about  $3\frac{1}{2}$  fathoms, with the mast at the settlement in line with the central beacon (pole with diamond topmark) bearing  $29^{\circ}$  true, distant (the beacon)  $3\frac{2}{10}$  miles. Another, near the west end of the island, at the edge of the 5-fathoms contour, with the mast in line with the bay beacon (triangle topmark) bearing  $65^{\circ}$  true, the latter distant  $1\frac{7}{10}$  miles.

Many coral knolls doubtless exist besides those marked on the plan. See remarks, on the plan.

**Directions.**—During the strength of the monsoons sailing vessels should always endeavour to pass to leeward of Pratas reef, on

*General charts 2661b, 1263.*

*Chart 362, Pratas reef and island. Var. nil.*

account of the invariable set of the current to leeward; for there are no soundings to indicate a near approach, and the weather is frequently thick and hazy in this vicinity. The safest quarter to make the reef is from the westward, the island being on its western side, and the currents in the neighbourhood invariably running in a north-east or opposite direction, according to the monsoon. Approaching the reef a vessel should be coned from aloft, as with the sun in a favourable position the bottom can be seen in 10 fathoms.

**Caution.**—The Pratas reef, lying in the route between Manila and Hong Kong, is a serious danger, especially in the north-east monsoon, when strong gales and thick clouds are sometimes prevalent for weeks together; and as, in this monsoon, vessels generally approach the reef from the south-eastward, the greater number of wrecks have occurred on this side.

*Chart 2661b.*

**Tide-rips**, having the appearance of a heavy line of breakers, were observed from the ss. *Wheeling*, about 40 miles north-east of the Pratas; probably fish.

**VEREKER BANKS**, two in number, are situated about 40 miles north-westward of Pratas reef; both are steep-to, with deep water between and around them.

North Vereker bank is 11 miles in length, in a north-west and south-east direction, and 7 miles in breadth within a depth of 100 fathoms; the least depth obtained was 35 fathoms, 2 miles south-east of the centre of the bank. No live coral was found. Centre, *lat.*  $21^{\circ} 8' N.$ , *long.*  $116^{\circ} 2' E.$

South Vereker bank, 8 miles in length, has a least depth of 32 fathoms, 2 miles westward of the centre of the bank. The depths between the banks are from 150 to 180 fathoms.

Heavy overfalls and tide-rips were met with in the vicinity of these banks.

**Bank.**—A sounding of 32 fathoms, sand and mud, has been obtained south-westward of Vereker banks, in *lat.*  $20^{\circ} 40' N.$ , *long.*  $115^{\circ} 18' E.$  approximately.

**Current.**—During the examination of Vereker banks (February) the current ran between W.N.W. and S.S.W., from a half to one knot per hour; the prevailing set was between W.N.W. and W.S.W. The current at times sets to windward. During calms or light south-west winds, the current sets between S.S.E. and E.S.E., with a rate of from a quarter to one knot per hour.

**Hong Kong approach.**—For the approaches to Hong Kong, see Chapter IX., from page 425, and Chapter X.

*General charts 2661b, 1263.*



## CHAPTER IV.

### THE GULF OF SIAM.

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Variation nearly stationary.

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#### WESTERN SHORE OF THE GULF.

(Coast *continued* from page 63.)

*Charts 1355 and 998. Var. about 1° 30' E.*

**General remarks.**—Northward of the state of Pahang is the state of Tringano, and beyond it is the state of Kelantan, all under British protection, *see* Chapter I. The country inland is a vast forest with only narrow footpaths, and is watered by numerous streams; in Tringano there are no less than 12, the principal of which bears the name of the state; some of these compare favourably with the Rumpin and Kuantan in Pahang. The Sungai Kelantan in Kelantan state is navigable by light steam launches for about 80 miles from the sea, and unlike the Tringano is but little obstructed by rapids.

**Trading season.**—During the north-east monsoon period trade may be considered closed, as these rivers are mostly impracticable except at high water springs combined with moderate or fine weather; small coasting steamers run regularly, fortnightly, entering the rivers at the time mentioned when practicable, or anchoring outside. During the south-west monsoon period the sea is calm, and trade in the rivers is more or less brisk.

The coast is composed of bright sandy beaches, interspersed with rocky points and in places massive headlands, and unlike the west coast of the peninsula is free from mangrove.

*Chart 1355, East coast of Malay peninsula.*

**COAST.**—From Tanjong Dungun (*Lat.* 4° 47' N., *Long.* 103° 27' E.), abreast Pulo Brala, the coast trends north-north-westward to Tringano head, with Pulo Kapas about 3 miles in the offing. Siatin rocks are the only known danger.

**Siatin rocks** are two in number; the outer one, with a depth of 6 feet, and 8 fathoms at a short distance around, lies 1½ miles off-shore, with the mouth of Sungai Siatin bearing 205° true, distant about 2½ miles; the other has a depth of 11 feet, and lies 2 cables westward of the outer rock.

*General charts 1355, 2414, 2660a.*

*Chart 998, Pulo Kapas to Lakon roads.*

**Pulo Kapas**, the south-west point of which is in *lat. 5° 13' N., long. 103° 16' E.*, is  $1\frac{1}{2}$  miles in length, north and south, three-quarters of a mile in breadth, and 478 feet in height. A large rock lies one cable north-west of it, and the south-west side of the island is foul to a short distance. The island is fertile, and inhabited by fishermen, who cultivate a few vegetables for their own consumption.

**Tringano head**, situated 5 miles west-north-westward of Pulo Kapas, is remarkable as the only rocky point in the neighbourhood. The hill within attains a height of 816 feet.

A rock awash at high water lies a quarter of a mile from the beach, and  $1\frac{1}{2}$  miles southward of Sungi Tringano entrance.

*Plan of Tringano on 998.*

**SUNGI TRINGANO** (*Lat. 5° 22' N., Long. 103° 8' E.*).—The entrance to this river may be known by the large opening it makes in the coastline, as well as by a remarkable hill, 755 feet in height, in the form of a cone, situated one mile southward of the town. There is also in the town on the river front a steep hill, 100 feet high, with a fort and flagstaff. The river has a bar with a depth of 7 feet at low water springs; within the bar, and just below the town, there is good anchorage in 4 to 5 fathoms, but the river abreast of the town is shallow.

Wood, water, and fresh stock can be procured.

**Light.**—In the fort, near the flagstaff, on a hill 100 feet in height, a *fixed white* light is exhibited from a white circular tower, visible about 2 miles. *Unreliable.*

**Tides.**—It is high water, full and change, at the entrance of Sungi Tringano, at 8h.; springs rise 7 feet, irregular.

*Chart 998, Pulo Kapas to Lakon roads.*

**COAST.—Eulo rocks.**—The coast from the entrance of the Tringano trends north-westward about 9 miles, and is low to Eulo village, where the high land approaches close to the beach. Eulo rocks, a small group, 6 feet high, lie off the village,  $1\frac{1}{4}$  cables from the beach.

**Seal bluff** lies 6 miles north-westward of Eulo, and is situated  $2\frac{1}{2}$  miles northward of a cone-shaped hill, 675 feet in height. The whole of the coast from Sungi Tringano is fronted by a shallow bank to the distance of about a mile.

**Coast.**—From Seal bluff the coast continues its north-western direction for about 60 miles to the mouth of Sungi Kelantan, with several off-lying islands. Sungi Libih discharges about 15 miles north-

*General charts 1355, 2414, 2660a.*

*Chart 998, Pulo Kapas to Lakon roads. Var. about  $1^{\circ} 20' E$ .*

westward of Seal bluff, and within it is a mountain range 3,388 feet in height.

The coast is low and fronted by a sandy beach until within 2 miles of Turtle-back island, 346 feet high and 2 miles off-shore, where there are two bluffs. From abreast Turtle-back island to about 15 miles northward, as far as it has been examined, it is fronted by a bank with less than 3 fathoms water.

**Seal rocks** (*Lat.  $5^{\circ} 34' N.$ , Long.  $103^{\circ} 0' E.$* ) consist of three rocks, the extremes of which lie north and south, nearly a mile apart. The southernmost rock is 7 feet high, the middle rock 2 feet, and the northernmost 3 feet.

The southernmost rock lies nearly  $2\frac{1}{2}$  miles from Seal bluff, having a channel between it and the bluff, with depths of 6 fathoms. A rock, awash at low water, lies a quarter of a mile north of the bluff. Both should be given a berth of half a mile.

**Bukit Trokit** is a rock 140 feet high, situated 4 miles northward of Seal rocks. There is a smaller rock, 5 feet high, lying nearly a mile westward of Bukit Trokit.

**House rock**, lying north-west  $10\frac{3}{4}$  miles from Seal bluff, and  $3\frac{1}{4}$  miles off-shore, is so named from its appearance.

**OFF-LYING ISLANDS.**—**Little Redang island**, or **Pulo Bedung** (*Lat.  $5^{\circ} 38' N.$ , Long.  $103^{\circ} 4\frac{1}{2}' E.$* ), 985 feet high, lies  $7\frac{1}{2}$  miles north-eastward of Seal bluff; there is an islet half a mile southward of Little Redang, with about 9 fathoms water between.

**Pulo Gulu** is an islet situated  $1\frac{1}{2}$  miles north of Little Redang, with Tikoro, a smaller one, a quarter of a mile beyond.

**Pulo Yu kechil and Pulo Yu besar**, situated 5 miles east of Little Redang, are two islets a mile apart in a north and south direction, with a depth of 24 fathoms midway between them. Pulo Yu kechil, the southern island, is 209 feet high; Pulo Yu besar is 316 feet in height.

*Plan of Great Redang harbour on 998.*

**Great Redang**, 1,139 feet high, situated 12 miles northward of Seal bluff, is 4 miles in length, north and south, 3 miles in breadth, and fairly steep-to all round. It has several islets and rocks on its south and east sides, but they are all steep-to. The island is thickly wooded, and a valley with mangrove swamp and a fresh-water stream running down to the harbour, divides it from north to south.

There is a bay on the north side, and a small harbour on the south side of the island, the heads of which are connected by low land, giving to Great Redang the appearance of two islands at a distance.

*General charts 1355, 2414, 2660a.*

*Plan of Great Redang harbour on 998.*

The harbour, with depth of 3 to 5 fathoms, is protected to the southward by Pulo Pinang, 458 feet high, and, although small, might be useful to a small vessel in distress, being easy of access. A coral reef extends about 50 yards off the east point of the harbour, increasing to about a cable off the bight within the harbour.

In the southern approach, at  $1\frac{1}{2}$  cables  $345^\circ$  true from Bukit Mara, is a rock awash at low water.

The passage northward of Pulo Pinang has a depth of 5 fathoms, but it is only a cable wide, and dangerous when the tidal stream runs strong. The most open approach to the harbour is eastward of Pulo Pinang in a least depth of  $3\frac{1}{2}$  fathoms.

**Anchorage.**—A vessel requiring wood and water in the south-west monsoon can anchor outside the harbour in a depth of 10 fathoms, with Bukit Mara, a small islet off the south part of the island, bearing  $182^\circ$  true, distant half a mile.

**Water.**—The only convenient watering place along this line of coast is at Great Redang island.

**Village.**—There is a village on Pulo Pinang, and a few huts scattered in different parts of Great Redang. The chief man holds his office from the Sultan of Tringano. Turtle may be caught in the proper season on the beach at the north end of Redang.

*Chart 998, Pulo Kapas to Lakon roads.*

**Pulo Lantinga**, 520 feet high, lies 5 miles west of Great Redang; the space between has not been sounded.

**Printian islands.**—This group, lying about 15 miles north-westward of Great Redang, is also safe to approach: the easternmost island is 1,134 feet, and the westernmost 1,195 feet in height. The islands are inhabited, but fresh water is scarce.

The channel between the two large islands is nearly half a mile wide in the narrowest part, in which rocks above water extend a considerable distance from the eastern island. There is good anchorage for small craft on either side of the channel, but the most secure is to the southward.

**High rock**, 735 feet in height, with off-lying islets, lies 2 miles north-west of Printian island: the channel between has a depth of about 12 fathoms. *See view of these islands on chart 998.*

The channel between the Printian islands and the mainland is safe, with depths of 8 to 10 fathoms in the fairway. There are no dangers that are not apparent, and attention to the lead will generally indicate the distance from the land.

*General charts 1355, 2414, 2660a.*

*Chart 998, Pulo Kapas to Lakon roads. Var. 1° 10' E.*

**COAST.**—**Menchat** (*Lat. 6° 5' N., Long. 102° 25' E.*) is a village on the coast, with about 500 inhabitants. A conspicuous object near it is a group of five cocoanut trees. A white flag is hoisted on a white staff when vessels are passing. The coast to the southward of the village is covered with jungle for about 2 miles, where it ceases, being replaced by cocoanut trees.

**Anchorage.**—There is a depth of 3 fathoms off the village, sand and shell bottom, deepening gradually to 7 and 8 fathoms, at 5 miles off-shore.

**Supplies.**—Cattle, goats, pigs, fowls, &c., are obtainable; the water is of indifferent quality.

*Sketch plan of entrance to Kelantan river on 998.*

**SUNGI KELANTAN.**—The delta of this river, formed by the deposits brought down by the several streams, has resulted in a considerable projection of the coast line, with sand spits, situated one and 2 miles seaward of it, as shown in the sketch plan. It consists of several mouths which connect above the delta and below the town. During floods a temporary channel is scoured over the bar. In 1902, the best channel was abreast the light-structure, but both the depth and direction of this and the other branches are continually changing; the entrances are sometimes blocked up altogether after gales of wind and new ones formed. The river at the town is about 2 cables broad and 2 fathoms deep; its banks here are very sandy.

The river is about 120 miles in length, taking its rise near the summit of the inland range of mountains to the south-westward.

The river is navigable for about 80 miles for steam launches drawing 2 feet. June and July are the months when there is least water in the river.

**Light.**—On the mainland, near the western end of the delta of the river, from a square wooden structure, painted white, a *revolving white* light, with a period of *seven seconds*, is exhibited, at an elevation of 87 feet above high water, visible in clear weather at the distance of about 6 miles. *Unreliable.*

**Directions.**—Vessels approaching the river from the south-eastward will be guided to it somewhat by three small hills, situated near the coast 12 miles to the southward, within Menchat, but they are said not to be conspicuous. Two of these hills, named the Paps, are 300 feet high; the third, Wedge hill, is 400 feet in height. The Paps will be in line with the sandy point eastward of the river when bearing 162° true. The light-structure made a good daymark for approaching the river entrance, which was situated near it in 1902, but the

*General chart 2414.*

*Sketch plan of entrance to Kelantan river on 998.*

entrance is constantly changing; the lead should be kept going. There is open anchorage off the mouths of the river in depths of 6 to 12 fathoms.

There is a mooring buoy for small craft in  $2\frac{1}{2}$  fathoms, at  $1\frac{1}{2}$  miles  $309^{\circ}$  true from the lighthouse.

*Chart 998, Pulo Kapas to Lakon road.*

**The town** of Kelantan, or Kota Bahru (*Lat.  $6^{\circ} 5' N.$ , Long.  $102^{\circ} 16' E.$* ), stands on the right bank of the main river, 13 miles from the entrance, near the confluence of its delta, which consists of five streams. It extends about a mile along the river front, and has a population of about 10,000 inhabitants, the greater part being Malays and Chinese. The houses are built chiefly of bamboo and atap.

The whole delta of the river is fertile and highly cultivated; it produces quantities of cocoanuts, a great variety of fruits and vegetables, maize, rice, tobacco, &c. Bullocks, sheep, goats, and fowls are plentiful.

**Trade.**—A considerable amount of trade in cattle, rice, and produce is carried on. The import and export duties collected by the Sultan amount to about 700,000 dollars annually.

**Telegraph.**—There is a telegraph station at Kelantan.

*Chart 998, Pulo Kapas to Lakon roads. Var.  $1^{\circ} 10' E.$*

**The COAST** for 40 miles north-westward of Sungi Kelantan has not been surveyed, but is believed to be safe to approach.

It is low land as far as the conical hill, 1,158 feet in height, on the coast about midway, and also beyond it to Hilly cape.

A range of mountains, the Sarong Lang, attaining a height of 2,643 feet, lies about 8 miles within the coast northward of Conical hill.

**Menara village**, with about 700 inhabitants, is situated on the coast at about 3 miles north-west of Conical hill, on the right bank of a small river.

A shifting sandbank extends from the south entrance point of the river in an east-north-east direction for a distance of about one mile, and a bar, having over it a depth of 3 feet at low water springs, obstructs the entrance. Spring tides rise about 7 feet.

A mudbank extends from the right bank within the entrance nearly half-way across the channel lying close to the left bank as far as the village, which is situated half a mile from the entrance. Good anchorage, in  $2\frac{1}{2}$  fathoms, soft mud, is found off the village.

A *white* light is generally exhibited at night on the approach of a vessel, but this cannot be depended upon.

**Supplies.**—Cattle, fruit, and vegetables are easily obtained, and good fresh water. Small steam vessels from Singapore and Bangkok call frequently.

*General chart 2414.*

*Chart 998, Pulo Kapas to Lakon roads. Var. 1° 10' E.*

**Baltu Rakil** (*Lat. 6° 41' N., Long. 101° 44' E.*) is a white rock, 35 feet in height, and steep-to; between it and the mainland there is a channel 3 miles wide, with depths of 6 to 7 fathoms in the fairway.

**Telupin.**—This village, with about 800 inhabitants, under the rule of the Sultan of Patani, is situated on Sungai Telupin, at about  $1\frac{1}{2}$  miles within the entrance.

An isolated clump of high trees is situated north of the entrance to the river, and there is a high white flagstaff.

The mouth of Sungai Telupin is obstructed by a shifting bar, over which at times there is only a depth of 2 or 3 feet at low water.

**ANCHORAGE.**—Telupin should be approached with the clump of high trees bearing 294° true, and anchorage obtained in a depth of 3 fathoms, blue mud bottom, at a distance of three-quarters of a mile from the shore.

During the north-east monsoon the heavy surf prevents loading or discharging cargo.

**SUPPLIES.**—Fruit, fish, cattle, and good fresh water can be obtained. The chief exports are rice, copra, damar, and rubber.

**Hilly cape** is the northern extreme of a chain of hills which attain a height of 1,636 feet in Bukit Tuna, 7 miles within, southward of which is a Table range 1,304 feet high. The cape is remarkable from its two steep bluffs, Grigre and Burrawas.

**PULO LOZIN** lies in the offing at 40 miles north-eastward of Hilly cape, in about *lat. 7° 22' N., long. 102° 0' E.*; it is about 100 feet in length, 7 feet high, and steep-to all round. A depth of 29 fathoms was obtained at  $1\frac{1}{2}$  cables south-south-east of it.

*Plan of Patani roads on 998.*

**TANJONG PATANI** is a low narrow sandy point covered with high trees, situated 16 miles west-north-westward of Hilly cape. The depths are irregular for about 5 miles north-north-west of it.

**Beating China shoal**, about 3 cables in extent within a depth of 3 fathoms, has been found off Tanjong Patani; the least depth on it is  $1\frac{1}{2}$  fathoms, over a sandy bottom, and situated 63° true, distant about  $4\frac{1}{4}$  miles from Tanjong Patani. (Originally reported by the s.s. *Breid* which grounded on it in 1912.)

**Loftus bank**, of hard sand, with depths of  $1\frac{1}{2}$  to 3 fathoms, is 3 miles in length, and lies parallel to and  $1\frac{1}{2}$  miles distant from the coast eastward of Tanjong Patani, between which there are depths of  $3\frac{1}{2}$  fathoms, mud.

**Kwala Patani** is 4 miles wide in its entrance, which lies between the point and the town; it is nearly dry at low water, and the depth is less than 3 fathoms for nearly  $2\frac{1}{2}$  miles off the town.

**Patani road**, about 4 miles westward of Tanjong Patani, affords anchorage in 3 to 5 fathoms, mud, the depths decreasing gradually towards the shore.

*General chart 2414.*

*Plan of Patani roads on 998. Var. 1° 10' E.*

The high trees on the eastern bank of Sungi Patani, bearing 136° true, is a good mark to approach the anchorage.

**The town** of Patani (*Lat. 6° 53' N., Long. 101° 16' E.*) stands on the eastern bank of the river about half a mile within the entrance, and is said to be a good place at which to purchase stock. Coasting steamers from Bangkok call four times weekly, twice each way. See Remarks on the province, Chapter I., page 6.

**Tides.**—It is high water, full and change, in Patani road, at 10h.; springs rise  $2\frac{1}{2}$  to 3 feet. The flood stream runs westward at the rate of 2 to 3 knots off Tanjong Patani.

*Chart 998, Pulo Kapas to Lakon roads.*

**The COAST** from the entrance of Sungi Patani is low, and trends in a westerly direction for about 18 miles to Kampong Tibu, thence north-westward to a sharp point, the termination of a ridge which backs the coast for the previous 7 miles. Within it is Table-top, 740 feet in height. Sungi Sokong discharges in the bay westward of the point. Two small streams discharge on this coast, the Pak sak and the China.

**Enemy Chaser shoal**, with a least depth of  $1\frac{1}{2}$  fathoms, lies 3 miles off-shore, with Tanjong Patani bearing 77° true, distant  $11\frac{1}{2}$  miles.

**Pulo Chelaji**, a small islet, 133 feet in height, lies about half a mile off the above sharp point, with rocks around it.

From the bay abreast, the coast again becomes low, and continues so to near Singora, about 21 miles north-westward.

At about 2 miles southward of the entrance to Singora is Lem Kau Rong, the northern termination of a range of mountains 17 miles in length, and attaining a height of 1,858 feet at its southern end.

The 3-fathoms edge of the bank fronting this coast extends about a mile off, and there are apparently no outlying dangers.

*Plan of Singora roads on 998.*

**SINGORA APPROACH.—Off-lying islets.**—Koh Gnu, one-third of a mile in length, and 279 feet in height, lies  $1\frac{1}{2}$  miles off the entrance to Singora; Koh Mu, 149 feet in height, lies  $1\frac{1}{2}$  miles northward of it, with the Luk Mu Nai rocks, 6 feet in height, between. Luk Mu Nok rocks, 4 feet high, lie two-thirds of a mile north-eastward of Koh Gnu, and there is a charted patch of  $2\frac{1}{2}$  fathoms between.

**Light.**—On Lem Sie, south side of the entrance, is exhibited from a white tower, 45 feet in height, at an elevation of 352 feet above high water, an *occulting white light*, every *thirty seconds*, showing *twenty-five seconds* light, eclipsed for *five seconds*, and visible from a distance of 10 miles in clear weather.

*General chart 2414.*



*Plan of Singora roads on 998. Var. 1° 10' E.*

**Directions.—Anchorages.**—Singora is easily identified by the hills with pagodas on them on either side of the entrance, and by the islands in the offing, and at night by the light.

During the north-east monsoon small vessels may anchor in  $2\frac{3}{4}$  fathoms, mud, about a quarter of a mile from the south-west side of Koh Gnu ; and during the south-west monsoon nearer the shore, in  $2\frac{1}{2}$  fathoms at half a mile southward of this island. Large vessels should anchor in 5 or 6 fathoms, with the south extreme of Koh Gnu bearing  $271^\circ$  true, and may reach this anchorage at night by steering for the light bearing about  $234^\circ$  true, by the lead.

**Tides.**—It is high water, full and change, in Singora harbour, at 8h. 30m. ; springs rise 2 to  $3\frac{1}{2}$  feet in the south-west monsoon. During the north-east monsoon the tide rises 6 feet, covering the North and South banks, and also the cluster of rocks adjacent to Lem Miva, nearly a mile east of the entrance.

The flood stream runs to the north-westward and the ebb to the south-eastward in the road at the rate of 2 to 3 knots.

**SINGORA** (*Lat.  $7^\circ 12' N.$ , Long.  $100^\circ 36' E.$* ).—The walled town of Singora is situated on the south side of the southern entrance to Tale Sap, an inland sea or lake mentioned below.

The population of the town, and suburbs across the water, is estimated to be 10,000, partly Siamese and partly Malay. There are some 60,000 people in the province, scattered in small communities along the shores of the Inland sea and in the jungle of the interior. Rice, tin, fish, skins, and horns are the principal products, sufficient to keep a considerable fleet of junks running to Singapore, Bangkok, &c. See province of Lakon Sritamarat, page 6.

**The entrance to Singora harbour** is about half a mile wide between the points, above which are the hills Kau Deng Yie, or Table hill, 598 feet in height, with two pagodas on the western side, and that of Kau Tang Kwan, or Pagoda hill, 307 feet high, with one pagoda, on the eastern side ; its approach is obstructed by shallow flats and quicksands, dry in places to the distance of about a mile ; Koh Gnu, the nearest island in the approach, is within the 3-fathoms line fronting the entrance.

**The bar**, and the middle ground within the entrance, are continually changing in form and depth, owing to the strong ebb stream, and to the heavy seas which break into the harbour during the north-east monsoon ; the channel should therefore be buoyed before attempting to enter. The plan shows a depth of one fathom on the bar between North and South banks, deepening to 3 or 4 fathoms between South bank and the west entrance point of the harbour, and under

*General chart 2414.*

*Plan of Singora roads on 998. Var. 1° 10' E.*

very favourable circumstances vessels of 12 feet draught are said to be able to enter, but it seems doubtful.

There is a narrow channel with 2 to 3 fathoms water as far as the town, about one mile up, by keeping close to the eastern shore and thence to the lake, if bound there.

**The Inland sea (Tale Sap)**, entered at Singora, extends about 40 miles in a north-north-west direction parallel to the coast, with a breadth varying from 2 to 10 miles, and is separated from the sea by a low sand ridge known as Kau Yie. It contains numerous islands, and the southern portion is navigable by small craft, there being a depth of about 9 feet on the western side which is the deeper, for some distance. Its northern portion is shallow, and the town of Patalung, on the western shore, can only be approached by small native boats. The lake is decreasing in depth; formerly, it is stated, there was a deep-water channel from Lakon road to the northward, into the lake, now only navigable by boats of 2 feet draught.

**Supplies.**—Wood and water may be purchased at the town, or the latter may be obtained from a spring within the bar on the west side. Stock of every description is plentiful. There is frequent overland communication between Singora and Penang, and the coasting steam vessels from Bangkok call frequently, every few days.

*Chart 998, Pulo Kapas to Lakon roads. Var. 1° E.*

**The COAST** from Singora trends northward to Lem Kolam Puk, and is low and sandy, with trees in places, for the whole distance; the lake or inland sea within apparently discharges occasionally through the coast, by the Klong Ra, some 42 miles from Singora; there are a few scattered huts or small villages on the coast, which is fronted by a bank with less than 3 fathoms to the distance of from about one to 1½ miles, into which the depths gradually decrease, with a mud bottom. There are no known dangers off it.

**KOH KRAH** (Lat. 8° 25' N., Long. 100° 45' E.), lying about 31 miles from the coast enclosing Lakon bight, is half a mile in length, and 530 feet high. Two rocks, 265 feet and 152 feet in height, and a rock 4 feet high (nearly awash at times), lie to the southward. Turtle are plentiful in the season. See view on 998.

*Charts 998 and 989.*

**LAKON.**—**Lem Kolam Puk** (Lat. 8° 28' N., Long. 100° 9' E.) is a narrow curved spit of coarse sand, 6 miles in length by 100 yards in breadth, with a cluster of fir trees on its extremity, within which is Lakon bight; Lem Kolam spit is the continuation of the point under water for a distance of about 4 miles northward.

*General chart 2414.*

*Charts 998 and 989. Var. 1° E.*

**Lakon bight**, about 9 miles in length, by 6 miles in breadth between its entrance points, is almost filled with mud, there being but little water over any part of it. At its head is the Klong Pakinang, which leads to Tale Sap, the lake or inland sea to the southward, navigable by boats of 2 feet draught, before mentioned. The head of the bight is only navigable for boats at near high water.

**Lakon road**, with depths of 4 to 5 fathoms, lies north-westward of Lem Kolam spit, off the mouth of the bight. The depth in the road is reported to be decreasing.

Lakon road affords anchorage in the south-west monsoon period in a depth of about 4 fathoms, at about 5 miles northward of the west point of entrance to Lakon bight.

**Directions.**—Small craft, bound to Lakon road from the southward, should round Lem Kolam Puk at a distance of not under 5 miles, thence steering to the westward and anchoring according to draught. If from the northward, keep in-shore, and anchor in a suitable depth near the inner fishing stakes. Sailing craft can usually work up in-shore against the south-west monsoon.

**Tides.**—It is high water, full and change, in Lakon road at 10h. 15m. Springs rise  $4\frac{1}{2}$  feet (in the south-west monsoon).

**The town** of Lakon, or Nakon, is charted about 6 miles westward of the west shore of the bight, and is stated to be about 5 hours pull up a very shallow stream (possibly in a laden canoe). The state or province of Lakon Sritamarat is one of the most populous and richest of the states of the peninsula, but owing to the exposed character of the road and the insignificance of the stream, Lakon is but rarely visited. See description of the province, page 6.

*Chart 989, Lakon roads to Lem Tane.*

**COAST.—Aspect.**—The following remarks are chiefly written from the chart.

From Lakon bight the coast trends northward to Devils and North-east points, forming the west side of Samui strait.

This coast is all low except at Lem Kwang and Lem Ple Dam, where at about one mile inland there are hills 489 feet and 708 feet high, respectively, and within the latter is Kau Kwang, 2,670 feet high; several small streams discharge through it, with unimportant villages near them. The depths gradually decrease to the mud bank which fronts the shore to the distance of half a mile.

About 12 miles within the coast line is the Kau Lu Ong range of mountains 5,814 feet in height, with Needle peak 5,274 feet, and Sharp cone 2,594 feet in height conspicuous points on it. Northward of this range are the Kau Prong 4,480 feet in height. Ten miles within Devils

*General chart 2414.*

*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

point is the Kau Pra Nom, 1,805 feet, with Horn hill (Kau Kwie) between it and North-east point.

Devils point is distinguished by five peaks, known as the Five Devils, one of which, in lat.  $9^{\circ} 10\frac{1}{2}'$  N., long.  $99^{\circ} 53'$  E., is 796 feet in height.

**A rock**, with 2 feet water, is reported by the native pilots to lie  $1\frac{1}{2}$  miles off Lem Ple Dam; the assigned position should be given a berth until disproved.

**SAMUI STRAIT** (*Lat.  $9^{\circ} 15'$  N., Long.  $100^{\circ} 0'$  E.*) lies between the north-east extreme of the peninsula (within which is the large and shallow bay known as Bandon bight), and the islands off-lying it. Between North-east point and Koh Kahten, the channel is 6 miles in width, but in it there are five islets with deep water around them.

The best passage, about 3 miles wide, known as West channel, lies between West island and the mainland; the eastern portion of this for a width of a mile or more has depths of about 8 fathoms. The continuation of the strait northward, named Middle passage, has a depth of about 6 fathoms. The branch channel to the westward, between Koh Mukapau and Koh Pahlicum, known as South passage, gradually decreases in depth to Bandon bight, which is only available for small craft.

The coast northward of North-east point is fronted by a bank with less than 3 fathoms to the distance of 3 miles, and on the bank, 2 miles off-shore, is a rock 313 feet in height.

**The tidal streams** probably run with considerable strength in the strait, as the flood, in the approach to the strait, is charted as running at the rate of  $3\frac{1}{4}$  knots to the northward.

**ISLANDS in and northward of the strait.**—*See view A on chart 989.*

**West island** (*Lat.  $9^{\circ} 16'$  N., Long.  $99^{\circ} 50'$  E.*), 236 feet in height, a narrow island nearly a mile in length, and surrounded by rocks, is the westernmost island in Samui strait. Koh Kwang, 250 feet high, and Koh Rap, which is low, are both fringed with rocks; White rocks, above water, lie northward of the above islands, and Smith islet farther in the same direction. There is deep water between all of them.

**Koh Kahten** is a triangular island  $2\frac{1}{2}$  miles in length, 774 feet in height, and surrounded by reefs; Mat Sum lies eastward of it. Between these islands and Koh Samui are several dangers (rendering the passage impracticable, except for very small craft), with An Koh Wan, 6 feet high, on a detached reef eastward of them. Koh Hah, 268 feet high, with other rocks above water, lie off the south-west side of Koh Samui.

*General chart 2414.*

*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

**Koh Samui**, the largest of the off-lying islands, is about 12 miles in length, about 7 miles in breadth, and attains a height of 2,269 feet in Kau Yie, its summit. It belongs to the province of Lakon Sritamarat. The island is surrounded by islets and shoals, for which see the chart. There are several small villages on the island inhabited by some hundreds of Chinese, who cultivate the cocoanut palm and rear large numbers of pigs and buffalo. There is some tin in the hills, but owing to the lack of water, it has not hitherto been worked with success. The island is clothed with dense forest, consequently the villagers communicate along the coast.

Anchorage will be found in the bays on either side, according to the prevailing monsoon.

**Communication.**—See Bandon, page 130.

**Koh Pennan**, 9 miles in length and 6 miles in breadth, attains an elevation of 2,220 feet, and belongs to the province of Chiya. It is fringed by a reef except on its south-east side, and is separated from Samui by Pennan channel. The small islets, Koh Klian, 80 feet, and Koh Tau, 397 feet in height, lie off its west side. There is anchorage around it according to the monsoon.

**Pennan channel**, 5 miles wide, has depths of 7 to 10 fathoms.

Table rock, 10 feet high, and Tong Krok, 83 feet high, 4 miles apart, mark the eastern limits of Pennan channel between these islands.

**Koh. Tau**, the northernmost island of the group, lies 19 miles north-north-westward of Koh Pennan, with Tau passage between.

The island is  $4\frac{1}{2}$  miles in length and 1,285 feet in height at its north-west extreme. Its west side is fringed by a reef, with islets off its north-west extreme, one of which is 387 feet in height.

**Tau passage** separates Koh Tau from Koh Pennan; it has general depths of over 20 fathoms.

Sail rock (*Lat. 9° 56' N., Long. 100° 0' E.*), 65 feet high, steep-to, lies in the fairway.

**Inner islands.**—Parallel to the islands above mentioned, at about 13 miles to the westward, are a number of islands extending about 30 miles in a north and south direction, nearly all of them within the 5-fathoms contour-line fronting Bandon bight. They form a breeding place for a large number of swiftlets which produce the edible nests.

**Koh Mukapau**, the southernmost, is 570 feet in height, and nearly 2 miles in length; it is surrounded by reefs.

**Koh Taluei**,  $6\frac{1}{2}$  miles northward of Mukapau, is the largest, being 3 miles in length and 1,246 feet in height. Between them are

*General chart 2414.*

*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

Koh Som, 381 feet, Gnueh Cheu, 411 feet, and Koh Cheuk, 450 feet high.

**Koh Angtong**, the next large island northward, is  $2\frac{1}{2}$  miles in length, and 1,377 feet high at its south end.

Angtong passage, between, is 3 miles wide, has a depth of about 4 fathoms, and is the best channel between the inner group of islands.

**Koh Wau and Koh Lān**, 327 and 190 feet high, respectively, are the northernmost of this group, with Castle islets southward of the former. There are several high islets, and a chain of numerous rocks, above water, filling the space between Koh Lim and Koh Angtong, 3 miles southward; the principal are Nang Yot, 603 feet, Koh Sam Yot, and Koh Klom Yot, 787 feet high.

**North passage** (*Lat. 9° 43' N., Long. 99° 40' E.*).—Between Castle islets and Koh Lim, 675 feet high, to the southward and just outside the 5-fathoms line, is North passage, 4 miles wide with a depth of about 10 fathoms.

**BANDON BIGHT** is nearly 15 miles wide between Lem Kung Mau and Lem Sie, but is very shallow, there being less than 3 fathoms for about 16 miles northward of the first-mentioned point. The banks are reported to be constantly changing and decreasing in depth, but it is some time since it was surveyed.

A sandbank, nearly dry at low water, lies from 2 to 3 miles eastward of Lem Sie; it should be given a wide berth.

Koh Prap bank, with 6 feet water, northward of the island, has a red buoy charted off its north-east extreme; the depth is only about a foot less than that of the water surrounding it.

**LIGHT.—Koh Prap** (*Lat. 9° 13' N., Long. 99° 25' E.*).—Koh Prap, 255 feet high, lies on the eastern side of Bandon bight,  $2\frac{1}{2}$  miles off-shore and  $5\frac{1}{2}$  miles northward of the entrance to Bandon river.

A group flashing light every one hundred and forty seconds, showing thus:—flash, *thirty seconds*; eclipse, *ten seconds*; flash, *five seconds*; eclipse, *five seconds*; flash, *five seconds*; eclipse, *eighty-five seconds*, is exhibited, from a red lattice structure, 20 feet in height, on the summit of Koh Prap, at an elevation of 275 feet, visible in clear weather from a distance of 12 miles.

**Anchorage.**—The eastern part of the bight has a depth of about 9 feet. Siamese steamers and other small craft anchor about 2 miles north-east of Koh Prap, in that depth, 7 miles from the entrance to Bandon river.

Nearly all the western part of the bight has less than 6 feet water, and is covered with fishing stakes. There is or was a pool with 5 fathoms in the Chiya sand, close north-westward of a sandbank, at

*General chart 2414.*

*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

2 miles south-east of the channel to Pumreang, but with only about one fathom at low water in the approach, which is from the north-eastward. There is a depth of 10 feet at high water over the flats to Chiya river, and about 15 feet inside the river entrance.

Trading vessels of or above 12 feet draught formerly used the anchorage 5 miles northward of Lem Sie, where there are depths of about  $3\frac{1}{2}$  fathoms; this is considered to be the best anchorage for steamers and other vessels loading or having communication with Chiya (Chaiya), Pumreang, and Bandon.

**Tides.**—For high water, full and change, in Bandon bight, *see* the chart, which gives a difference of several hours for various parts of this coast.

**Bandon river** is accessible to vessels of about 6 feet draught, and it divides into two main branches above the town, which is about 4 miles within the entrance; the eastern branch takes its rise in the mountains near Trang, where it is stated the watershed is so low that a boat can be taken across with a very short portage to the upper waters of the Trang, the total distance to Trang (Malacca strait) being about 170 miles.

The population of the province of Bandon is about 20,000, chiefly Chinese, engaged in exporting jungle produce, such as rattans, skins, and horns; quite a fleet of junks trade from here.

The province of Chiya (Chaiya) lies northward of Bandon with a population of about 43,000, Siamese and Malays (no Chinamen). It suffers from a want of navigable streams, so neither tin nor timber can be worked at a profit.

**Steam communication.**—The steamships of the Siam Steam Navigation Company call four times a week (twice each way) at the ports of Bandon, Langsuen, and Chumpawn, and twice a week at the island of Koh Samui on the voyage from Bangkok to Singapore and vice-versâ. This company carries the mails, and is subsidised by the Siamese Government. Three small steamers, owned by a Siamese subject, run between Bangkok and the ports of this province, and the steamers of the Chumpawn Company do the same, and are also engaged in the coasting trade.

**COAST.**—From Lem Sie the coast trends northward to Sawi and Chumpon bays off which the bank fronting the shore extends about 3 miles in places; it is advisable to keep seaward of the 10-fathoms line unless intending to visit any particular place, when vessels should haul in when abreast of it.

**Loftus shoal**, consists of three patches, covering a space 2 miles in length, in a north-west and south-east direction, with 6 fathoms

*General chart 2414.*

*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

water on its seaward side; a rock on the centre shoal is apparently above water; it lies with Lem Bangman (off which is Luk Sua, 6 feet high), bearing  $308^{\circ}$  true, distant 4 miles. A 2-foot patch is charted  $3\frac{1}{2}$  miles  $159^{\circ}$  true of the rock above water; abreast the latter, but within the 3-fathoms line fronting the shore, are North and South patches, both said to be dry at low water.

**Buoy.**—A black buoy is moored on the south side of the western patch of Loftus shoal.

**LANGSUEN ROAD** (*Lat.  $9^{\circ} 57' N.$ , Long.  $99^{\circ} 11' E.$* ), with a depth of about 5 fathoms, is situated 3 miles off the river and village of that name; the river is barred, but has a depth of about 6 feet at high water; in the rainy season the stream runs out at the rate of about 4 knots. *See view B on chart.*

**Dangers.—Buoys.**—Falcon patch, with 3 feet water, lies  $1\frac{1}{2}$  miles north-east of the mouth of the river, marked by a black and white buoy, southward of which is a patch of  $1\frac{1}{2}$  fathoms.

A red conical buoy is charted at the edge of the 3-fathoms contour,  $2\frac{1}{4}$  miles southward of the mouth of the river, at about one mile off the Red cliff, said to be marking South Inner patch.

A patch of  $3\frac{1}{2}$  fathoms lies  $111^{\circ}$  true,  $2\frac{1}{4}$  miles from Red cliff.

East patch, awash at low water, lies on the south side of the road with the mouth of the river  $279^{\circ}$  true distant nearly 3 miles; there is another patch between it and the shore bank.

**LIGHT.**—From a white iron structure on south side of entrance to the river, is exhibited at an elevation of 41 feet, an *occulting* light *every fifteen seconds*, with *white* and *red* sectors, showing *ten seconds* light and *five seconds* eclipse, visible about 8 miles. It shows *red* over the road and the seaward dangers, and *white* in-shore of the bearings  $223^{\circ}$  true and  $308^{\circ}$  true.

**The district** of Langsuen has a population of about 16,000; the chief resides about four hours' pull up the river. The principal produce of the neighbourhood is fruit; there are tin mines in the district, and fishing is carried on to a considerable extent.

Mail steamers, *see* Bandon, page 130.

**COAST.**—**Koh Petak** (*Lat.  $10^{\circ} 3' N.$ , Long.  $99^{\circ} 10' E.$* ) is an islet 425 feet in height, half a mile off Lem Tong Woh, 6 miles northward of Langsuen; a ledge of sunken rocks, with one of them above water, extends one mile seaward of it.

The bay northward of Koh Petak is guarded by the islets Koh Ranpahtat, Koh Kang Sueh, and Koh Mate Yie, just within the 5-fathoms contour line, within which vessels should not venture; these are good

*General chart 2414.*



*Chart 989, Lakon roads to Lem Tane. Var. about 1° E.*

objects to use for fixing the position of a vessel in this locality. See view B on chart.

**Sawi bay**, 6 miles wide, is shallow nearly out to its entrance points. It is fronted by islets, namely, Kulah, Yung, Klap, Tang Lang, and Katu, and there are several others off the coast between Katu and Mat Kra; vessels of light draught only can use Sawi bay, avoiding the charted dangers, most of which have rocks above water on them.

**CHOMPORN (Chumpawn) BAY**, northward of Sawi bay, has the islets of Mat Kra, Pau Kleuh, Teluh, Luk, Nam, Tah Kai, and Samet in its approaches; the easternmost is Koh Nam, 380 feet in height; those without the 10-fathoms contour line have apparently deep water between them; there are also rocks above water named Lak Mat Kra and Lak Nam, near the islands of same name, as charted. Koh Samet, 320 feet high, is within the 3-fathoms line which fronts the south point of the bay.

The bay is about 2 miles wide between the rocky patch off its north point and Koh Samet, and affords anchorage in 4 to 5 fathoms during the south-west monsoon period, at 2 miles off the mouth of the river.

Under Koh Samet there is shelter for small craft in the north-east monsoon.

**LIGHT.**—A *red fixed* light, elevated 128 feet, and visible from a distance of 10 miles, is exhibited from an iron structure on pillars surmounted by lattice work supporting lantern, painted red, situated on Mataphon islet, at the entrance to Chomporn river.

**Chomporn (Chumpawn) river** has a depth of 8 feet on its bar at high water. About 20 miles up is the town of same name, near the centre of the Malay peninsula, which is here about 48 miles across.

**Tides.**—It is high water, full and change, at Chomporn bay, at 6h. 40m., with a rise of about 4 feet.

*Charts 989, 2719.*

**COAST.**—**Lem Tane** (Lat.  $10^{\circ} 41' N.$ , Long.  $99^{\circ} 21' E.$ ) is a peninsula projecting  $1\frac{1}{2}$  miles southward of the coastline on either side of it, at 12 miles northward of Chomporn bay. At its extreme is a hill with a red cliff. Within the peninsula is a bay with a depth of about 2 fathoms, which affords shelter to trading craft off the village of Bang San.

*Chart 2719, Lem Tane to Koh Ta kut.*

Koh Kye, 362 feet in height, lies 3 miles north-east of Lem Tane.

*General chart 2414.*

*Chart 2719, Lem Tane to Koh Ta kut.*

**Lem Chong P'ra** is a remarkable craggy headland of 1,060 feet elevation in *lat.*  $10^{\circ} 54' N.$ , *long.*  $99^{\circ} 30' E.$

Koh Buot, a narrow island, 900 feet high, lies south-westward of the cape, within which is a snug bay named Chong P'ra. There are four islets or high rocks south-eastward of Koh Buot, the two outer of which, Rang Pet and Rang Kye, are 100 feet high, one mile apart, and distant about 5 miles from the shore; the others are 140 and 200 feet high, the latter is named Koh Rang.

**Lem Tong Lan** lies 18 miles northward of Chong P'ra. About midway within the bay formed by these points, is Koh Tlu, a level cliffy island, 342 feet high, and nearly  $1\frac{1}{2}$  miles in length. Within and south-westward of this island are two rocky islets named Chang and Sing, surrounded by reefs. There is no clear passage for vessels between Sing and Koh Tlu. Excepting the foul ground about Koh Tlu, the bay is safe.

Lem Tong Lan is 814 feet high, and the coast being very low within, at a distance it makes like an island. At 11 miles northward of Lem Tong Lan, there is the Cone clump, a cluster of conical hills, with a low islet surrounded by a reef, at the distance of a quarter of a mile from the shore.

**Koh Chan** (*Lat.*  $11^{\circ} 37' N.$ , *Long.*  $99^{\circ} 44' E.$ ), an island 80 feet high, with depths of 7 to 8 fathoms around it, is situated 4 miles off the coast, and about 17 miles north-eastward of the Cone clump just mentioned.

**Kau Luang**, a mountain 4,326 feet in height, which is by far the most conspicuous landmark in this neighbourhood, lies abreast Koh Chan at about 7 miles within the coast.

**Koh Luem**, 406 feet high, lies  $1\frac{1}{2}$  miles off Aotinau bay. The points of the bay have each a remarkable rocky horn, known as North and South Horns, 794 and 907 feet high, respectively. Klet Kla, an islet or rock, lies in the middle of the entrance.

Aotibon lai, the bay, northward of North Horn, affords the better anchorage. Koh Lak lies close to its south point, North Horn. The mountain Kau Maun lies 7 miles within the head of the bay, with a pass over it at 750 feet above the sea.

*Charts 2719, 2720.*

**Koh Ta kut** (*Lat.*  $12^{\circ} 11' N.$ , *Long.*  $99^{\circ} 59\frac{1}{2}' E.$ ), 300 feet high, situated about 28 miles north-north-eastward of Koh Luem, is a narrow island one mile in length; the coast between these islands is apparently clear of danger outside the 3-fathoms line, but it has not been properly surveyed.

*General chart 2414.*

*Charts 2719, 2720.*

**Landmark.—Samroi-yot hills.—Sui point**, situated about half a mile south of Koh Ta kut, is the end of a spur extending from a remarkable range of rocky mountains near the coast, named Samroi-yot, or Three Hundred peaks, and ranging from 1,813 to 1,900 feet in height. At a distance their appearance is that of a serrated table island.

Samroi-yot is unlike any other land in the gulf, and sailing vessels bound to Bangkok in the south-west monsoon should make it.

**Water.**—The only fresh water to be obtained between Chong P'ra and Sui point is from wells, which have been provided at places convenient for the use of native craft, by wealthy benevolent Siamese.

*Chart 2720, Koh Ta kut to Cape Liant. Var. about  $1\frac{1}{4}^{\circ}$  E.*

**COAST.**—The coast takes a northerly direction from Koh Ta kut, and for about 10 miles the 3-fathoms line is from 2 to 3 miles off-shore.

A rocky patch of  $1\frac{1}{4}$  fathoms lies within the edge of the line,  $1\frac{1}{2}$  miles off-shore, with Koh Ta kut bearing  $180^{\circ}$  true, distant  $8\frac{1}{2}$  miles, it is steep-to and should be given a wide berth.

**Koh Num sau** (*Lat.  $12^{\circ} 14' N.$ , Long.  $99^{\circ} 58' E.$* ), 500 feet high, lies 2 miles north-north-west of Ta kut, with rocks between it and the shore.

**Pran rocks**, two in number, each about 100 feet high, and three-quarters of a mile apart, lie 17 miles northward from Koh Ta kut, about a mile from the coast. The village of Pran is situated at the entrance of the river of the same name, 4 miles southward of these rocks.

**Sunken rock.**—A small headland stands out prominently from the coastline at 2 miles northward of Pran rocks;  $91^{\circ}$  true, distant three-quarters of a mile from it, is a rock which dries at half ebb.

**CHULAI POINT.—Aspect** (*Lat.  $13^{\circ} 2' N.$ , Long.  $100^{\circ} 3' E.$* ).—From the headland just mentioned, the coast trends northward about 32 miles to Chulai point, and is low.

A few miles within is the Triple peak range 2,100 feet in height, with Chulai peak 1,200 feet in height nearer the coast. Near the middle of this coast there is much rocky ground, and some patches of 2 to 3 fathoms lie on a rocky ridge from 3 to 5 miles off-shore; from the outer patch,  $2\frac{3}{4}$  fathoms, of those charted, Chulai peak bears  $297^{\circ}$  true, distant about 8 miles.

**Caution.**—Other patches may exist where no soundings are shown; vessels, therefore, should give this coast a wide berth and not stand into less than 10 fathoms.

*General chart 2414.*

*Chart 2720, Koh Ta kut to Cape Liant. Var. about  $1\frac{1}{4}^{\circ}$  E.*

**The COAST** about Chulai point and to the northward of it is all very low. The edge of the bank extends from 2 to 3 miles off the shore and is steep-to, especially off the village of Banlam.

Within Banlam point the low coast trends north-westward, forming a bay towards which the depths decrease regularly in most places, from whence along the head of the gulf to the bar of Bangkok river the lead will be found a safe guide by day or night; patches of 3-fathoms are charted between the 3- and 5-fathoms contours.

**Pechaburi town** (*Lat.  $13^{\circ} 6' N.$ , Long.  $99^{\circ} 55' E.$* ) is 8 miles up the river of the same name, the principal entrance to which is 5 miles north-west of Banlam point. It is clean, well-built, densely populated, and the centre of a great rice-producing district. In point of climate it is preferable to Bangkok, and more likely to agree with Europeans. The anchorage off the entrance of the river is far more sheltered in the south-west monsoon than that off the bar of Bangkok river, and cargo might be safely embarked at all times.

**The railway** runs from Bangkok to Pechaburi.

**Menam Tachin**, situated about 20 miles westward of Bangkok river, was navigated by H.M.S. *Teazer*, of about 11 feet draught, in November, 1871, about the time of the highest tides of the year, as far as Nakonchisi, about 25 miles from the mouth.

The bar extends from 3 to 4 miles off with a depth of about 3 feet at low water springs; the river deepens to 2 fathoms within, abreast the entrance points, and above to 3 and 6 fathoms.

The rise of tide is extremely variable, and ranges from 4 to 9 feet, or even more; *see* tides, Bangkok, pages 173-175.

The entrance is difficult to distinguish, the land in the neighbourhood being low, and covered with trees. It may, however, be safely approached by the lead; some 3-fathoms patches lie between the 3 and 5 fathoms lines off the entrance.

For the shore of the gulf eastward, *see* Bangkok river, page 170.

## EAST AND NORTHERN SHORES OF THE GULF OF SIAM.

*Plan of Pulo Obi on chart 2723. Var. about  $2^{\circ}$  E.*

**PULO OBI**, the principal island of the Obi group, lies about 11 miles south-eastward of Cambodia or Kamáo point, in lat.  $8^{\circ} 26' N.$ , long.  $104^{\circ} 48' E.$ ; it is  $2\frac{1}{2}$  miles in length, and about 950 feet in height at its south end.

A bank with 3 to 5 fathoms, mud bottom, extends 2 miles north-west, and another with same depths, but rock bottom,  $1\frac{1}{2}$  miles south-east of the island.

An islet, 541 feet in height, lies a mile south-east of the south end of Pulo Obi, with a rock or islet east of it.

*General chart 2414.*

*Plan of Pulo Obi on chart 2723. Var. about 2° E.*

Hull rock, 32 feet in height, lies 4 miles south-eastward of Pulo Obi, with depths of 14 to 15 fathoms between it and the islets mentioned.

Marsh reef, situated 356° true 3¼ miles from the north point of Pulo Obi, is awash at low water.

**Shoals.—Caution.**—Various reports have been received of the extension of the bank off and southward of Cambodia point. Patches of 2 to 3 fathoms are now charted from 4 to 5½ miles south-westward of the point, and depths of 5 to 5½ fathoms were reported by H.M.S. *Britomart* in 1902, from 6 miles westward of Pulo Obi to one mile southward of the island, where depths of 13 fathoms are shown. Patches of 2¼ and 2¾ fathoms are charted outside the 5-fathoms contour, at about 88° true, 9 miles, and 83° true, about 5½ miles from Pulo Obi lighthouse.

As the shore bank seems to have extended considerably, vessels should not take the passage within the island, and, further, should give both it and Cambodia point a berth of at least 12 miles.

**LIGHT.**—On the eastern summit at the south end of Pulo Obi, from a square light-grey granite tower, about 49 feet high, elevated 984 feet above high water, a *white flashing* light is exhibited showing *one short flash every five seconds*, said to be visible in clear weather from a distance of 40 miles. Within a distance of 8 miles from the island the light is obscured by the land between the bearings of 41° true and 55° true; as the light is approached this obscured arc increases.

**Anchorage.**—There are two small bays, one on the north-west, the other on the east side of Pulo Obi. The best anchorage for small craft is directly off them, on either side of the island, according to the monsoon, at about half a mile from the shore. Larger vessels must anchor farther off. The depths near the anchorages were reported (April, 1904) to have one fathom less water than those shown on plan; *see* preceding caution.

**Water.**—Fresh water is plentiful in these bays, but the shores are not convenient for embarking it; the islands are densely wooded.

**Royalist bank** (*Lat. 8° 11' N., Long. 105° 11' E.*), on which depths of 6 to 10 fathoms were found when crossing it for a distance of 1¼ miles, and depths of 17 fathoms at each end, lies about 27 miles 122° true from Pulo Obi; less water may exist. Another bank of 6 fathoms is charted 75° true, 20 miles from Royalist bank. (*Chart 2414.*)

**Bank.**—There is an extensive bank which has not been examined, with charted depths of 8 to 10 fathoms, and deeper water around, situated with its centre about 265° true 75 miles from Pulo Obi, in lat. 8° 10' N., long. 103° 35' E.

*General charts 2723, 2414, 2660a.*

*Chart 2723, Bay island to Pulo Obi. Var. about 2° E.*

**Cambodia, or Kamáo point** (*Lat. 8° 36' N., Long. 104° 42' E.*), the south-western extreme of Cambodia, is low and covered with trees. The edge of the bank surrounding the point was formerly steep-to beyond a distance of about 2 miles, but it has considerably extended; *See* caution on page 136.

To the northward of Kamáo point the depths are more regular. There are numerous fishing stakes on the bank.

**Kamáo (Song Bai hap) river.**—From Cambodia point the land trends east-north-eastward for 17 miles, forming with the coast northward a deep but shallow bay, at the head of which is Kamáo river; it is fronted by a bar to the distance of about 5 miles, nearly dry at low water, and covered with fishing stakes. It is accessible to junks and other native craft. Boats can proceed from it through the inland waterways to the Gang hao, and thence into the China sea.

**Song ong dok** discharges into the bay northward of the Kamáo; it is visited by junks from Singapore and Hainan, which ascend for many miles.

**The coast** from the north side of approach to Kamáo river trends in a northerly direction for about 50 miles to abreast the Pulo Dama group, the land between being all low, with the exception of the Paps, two small rocky bluffs, 100 feet in height, on the coast.

**False Pulo Obi** (*Lat. 8° 57' N., Long. 104° 31' E.*), 23 miles north-north-westward of Cambodia point, is three-quarters of a mile in length, half a mile in breadth, and 500 feet in height, with cliffy sides, and steep-to all round. At 4 miles south-south-eastward from False Pulo Obi is a rocky islet, 167 feet in height, with a ledge of rocks projecting a quarter of a mile from its east side. The channel between the two has a depth of 11 fathoms, and between them and the coast are depths of 6 to 9 fathoms.

*Plan of Pulo Panjang on 2101.*

**OFF-LYING ISLANDS AND DANGERS.**—**Pulo Panjang**, situated in *lat. 9° 18' N., long. 103° 28' E.*, the main island of the Panjang group, is 3 miles in length, east and west, 2 miles in breadth, and of a nearly uniform height of 550 feet, appearing like table-land from every direction.

There are two islets 100 and 200 feet in height at about a mile from its east end, with deep water between. Peak islet is connected to the south point of Panjang by a ridge of rocks, with 6 feet water over it. White rock, 75 feet high, lies 13° true  $1\frac{3}{4}$  miles from its south point; and two large rocks, East island and Table rock, elevated 110 and 40 feet, respectively, lie about  $8\frac{1}{2}$  miles north-eastward from Panjang.

*General charts 2414, 2660a, 1263.*

*Plan of Pulo Panjang on 2101. Var. about 2° E.*

**Rajanattianuhar reef**, on which the British steam vessel of that name became a wreck, consists of two heads of rock, with 4 feet water, surrounded at the distance of a cable by a fringe of coral, with depths of 2 to 5 fathoms, and steep-to. The centre of the reef lies with White rock bearing 247° true, and Peak island 340° true, distant 7 cables.

**Anchorage.**—During the north-east monsoon the bay on the south-west side of Panjang affords shelter and good anchorage. A rock, 2 feet high, lies 227° true about 6 cables from West point of this bay. Fresh water and wood can be obtained, and fish may be caught with a seine. The anchorage on the south-east side of the island is indifferent.

*Chart 2722, Koh Kut to Bay island.*

**Dewagougse shoal.**—The master of the steam vessel *Dewagougse*, 1888, reported the existence of a shoal with a depth of 3 fathoms, on which that vessel struck, situated with Pulo Panjang bearing about 160° true, distant 17 miles, or in lat. 9° 35' N., long. 103° 21' E.

**Caution.**—Pulo Wai or Koh Kwang Noi, Veer islet, Koh Prins, the Tankwala group, and Depond reef, have been surveyed; and the soundings taken in the neighbourhood seem to denote that the passages between them are safe; but as time would not permit the approaches from the northward and westward to be sounded, caution must be observed when steering for them from those quarters.

The channel between these islands and Koh Tron is believed to be safe.

*Plan of Pulo Wai on 2101.*

**PULO WAI**, or Koh Kwang Noi, about 50 miles north-west of Pulo Panjang, consists of two islands from 200 to 300 feet high, each being nearly 2 miles in length, from a quarter to three-quarters of a mile in breadth, and fringed by reef in places. They are distant nearly a mile from each other, and the channel between them has depths of above 10 fathoms in the fairway (*Lat. 9° 55' N., Long. 102° 53' E.*).

A rock, 3 feet high, lies 112° true three-quarters of a mile from the east point of the eastern island, and a patch of 4½ fathoms lies 160° true, 2¼ miles from the same point.

Saracen rock, with 4 feet water, lies 8 cables 346° true from the north-west end of the eastern island.

**Anchorage.**—Good anchorage will be found off the north side of the eastern island, but the best berth is off a sandy bay on the north-

*General charts 2722, 2723.*

*Plan of Pulo Wai on 2101.*

east side of the western island, in a depth of 8 fathoms, at a quarter of a mile from the shore.

**Water.**—The natives obtain their water from wells about the middle of the eastern island. The islands are wooded; the beaches afford turtle; and a cast of the seine will generally procure fish.

*Chart 2722, Koh Kut to Bay island.*

**Depond reef**, only half a cable in diameter, is awash at low water, steep-to on all sides, and in fine weather might not be noticed until close upon it. From the reef, the peak at the south end of the western Pulo Wai is visible over the middle of the eastern Pulo Wai bearing 255° true, distant 14 miles.

**Koh Tang, or Tankwala island**, lying north-north-eastward 24 miles, from Pulo Wai, is  $3\frac{1}{2}$  miles in length, narrow, and 440 feet in height near its north end, situated in 'lat. 10° 18' N., long. 103° 5' E.

The sandy bay on its eastern side will afford good anchorage in the south-west monsoon; and Shelter islet, lying in the middle of the bay, would afford some shelter to a small vessel anchoring here in the north-east monsoon.

At one mile south-east of Koh Tang is an islet, and at  $4\frac{1}{2}$  miles east-south-eastward are South-east islets, two islets, 106 and 141 feet in height, with depths of 15 fathoms between. Patches of  $3\frac{3}{4}$  and  $4\frac{3}{4}$  fathoms lie respectively about three-quarters and  $1\frac{1}{4}$  miles south-south-east of the south-easternmost islet.

**Veer islet**, 120 feet in height, lies 254° true  $14\frac{1}{2}$  miles from the summit of Koh Tang, with apparently deep water around it.

**Koh Prins**, 200 feet in height, lies 292° true  $10\frac{1}{2}$  miles from the summit of Koh Tang, and is about one mile in length; an islet, 150 feet in height, lies half a mile 250° true of it, and one, 20 feet high, lies nearly a mile westward of the latter.

**REPORTED SHOALS.**—In lat. 10° 41' N., and long. 102° 51' E., a depth of 9 fathoms was obtained by H.M.S. *Weasel*, in 1868. Lieut. Ellis, in 1868, states: "It is believed that a reef was seen near this spot, but bad weather prevented its being closely examined."

**Condor reef**, on which the Bremen barque *Condor* was lost in 1860, was reported to be in lat. 10° 42' N., long. 102° 48' E. In 1872 it was examined by Lieut. Veron of the French navy, and found to be a rocky plateau half a cable in extent, with general depths of 16 to 20 feet, and several spots of one to 6 feet; it is fairly steep-to, especially on the west side. From this examination the shoalest part was placed in lat. 10° 43 $\frac{3}{4}$ ' N., long. 102° 53 $\frac{1}{4}$ ' E.; it might possibly be a mile or so farther west.

*General chart 2414.*



*Chart 2722, Koh Kut to Bay island. Var. about 2° E.*

**Jan Peter reef.**—In 1880 the *Jan Peter* grounded on a reef with 2 fathoms water, and by bearings was placed in lat.  $10^{\circ} 46' N.$ , long.  $102^{\circ} 42' E.$  This is close to the position of a wreck on a reef reported by Captain Ellis, of the ship *Cowasjee Family*, in 1860, bearing about  $191^{\circ}$  true from Kusrovie rock, distant 20 miles.

**Donai.**—A shoal or obstruction on which the ss. *Donai* touched in 1908 is reported to be in lat.  $10^{\circ} 51' N.$ , long.  $102^{\circ} 50\frac{1}{4}' E.$  A sounding of 18 fathoms was obtained after touching it.

**Simpson shoal,** reported in 1886 to be in lat.  $11^{\circ} 26' N.$ , long.  $101^{\circ} 12' E.$ , is stated to have been plainly seen, but that before the lead could be got ready the vessel had passed over it; a sounding of 18 fathoms was then obtained. Its existence is extremely doubtful. (*Chart 2414.*)

**Koik rock.**—From information received, communicated by Captain A. J. Loftus of the Siamese Government, there is every reason to believe that a sunken rock exists about 83 miles north-east of Koh Tau, in the fairway of the northern part of the Gulf of Siam:—

This rock (Koik rock), originally reported by the master of the Norwegian barque *Koik* in 1882, was stated to be about 12 yards in length in a north and south direction, with about 6 feet water on it. The position reported must be considered doubtful.

Two reefs were reported in 1889 in this neighbourhood, namely, in lat.  $10^{\circ} 45' N.$ , long.  $101^{\circ} 1' E.$ , and in lat.  $10^{\circ} 45' N.$ , long.  $100^{\circ} 56' E.$ ; they are probably all one and the same reef.

*Plan of Pulo Dama anchorage on 2723; also chart 2723.*

**PULO DAMA GROUP.**—Hon Nam Du (Lat.  $9^{\circ} 41' N.$ , Long.  $104^{\circ} 21' E.$ ), the principal island, is situated 43 miles north-north-westward from False Pulo Obi; it is  $3\frac{1}{4}$  miles in length, north and south, and one mile in breadth, having near its centre a sharp peak, 1,015 feet in height. Several islands lie off its north point, and off its eastern side. The northernmost, Hon Gian, is 345 feet in height, with Hon Mok, also 345 feet high, between it and the main island. The eastern islands are Hon Truok, 295 feet, Hon Truong, 345 feet, Hon Dhau, Hon Botra, 295 feet, and Hon Mau, the southernmost.

Three islands lie off the south extreme of Hon Nam Du, the southernmost of which is Hon Mong tai; a rock 4 feet high lies half a mile south of it, and about the same distance beyond is a patch of  $2\frac{1}{2}$  fathoms, steep-to.

Aspic rock, with 2 feet water, lies 3 cables  $27^{\circ}$  true from the north-west extreme of Hon Truok, with depths of 5 to 15 fathoms

*General charts 2414, 2660a, 1263.*

*Plan of Pulo Dama anchorage on 2723; also chart 2723.*

between. Another rock, awash at low water, lies  $1\frac{1}{2}$  cables north-westward of Aspic rock.

There is a rock awash, at a quarter of a mile westward of the islet (157 feet high), situated  $250^\circ$  true one mile from Hon Gian. For others, *see* the plan and the chart.

**Anchorage.**—During the south-west monsoon the best anchorage is in about 5 fathoms eastward of the highest peak, with Hon Nhom in line with Hon Gian to the northward; the holding ground is good, but squalls of wind come off the high land.

There are two patches of 3 fathoms 6 cables apart, north and south, eastward of the anchorage marks mentioned, for which *see* the plan.

During the north-east monsoon, there is anchorage in about 7 fathoms south-west of Hon Mau, the south-easternmost islet; also under the west coast of Hon Nam Du at the entrance of a small bay, situated abreast the south point of Hon Kolon. There is, however, a rock with  $2\frac{1}{2}$  fathoms of water over it in the middle of the latter bay.

*Chart 2723. Bay island to Pulo Obi.*

**Tammassu (Hon Ré)** is a table-topped island, 1,390 feet in height, with steep cliffy sides, situated 16 miles east-north-eastward from Pulo Dama, with depths of 5 to 6 fathoms apparently around it. Fresh water was found in small quantities. The island is frequented by fishermen and junks.

A pinnacle rock, with a depth of 5 feet, lies  $3\frac{1}{2}$  cables  $300^\circ$  true from the west point of Tammassu; vessels should not pass between this rock and the rocky ledge, almost covered at high water, extending about a cable from the point.

**Teksu island (Hon Tre)** known also as Turtle island from its shape, 13 miles north-eastward of Tammassu, is of conical form, and 1,380 feet in height. The island lies near the edge of the mud flat, which fronts the mouth of the Kieng Kiang or Rach-Gia for a distance of about 15 miles. The island is partly cultivated and now produces oranges, pineapples, &c., and there is excellent water. The plantation (under the French) is at the south end of the island, but the anchorage off it is shallow and indifferent.

**Teksia peak** is a cone, 800 feet in height, on the north side of approach to the Rach Gia, and remarkable as the first high land on the mainland seen on approaching from the southward. Eastward or within this peak there is an anchorage for large trading junks; their cargoes are brought out from the river in the flat boats of the country.

**Kieng Kiang (Rach Gia).**—The bar of this river dries at very low tides, but there is a depth of about 10 feet in the entrance; it con-

*General charts 2414, 2660a, 1263.*

*Chart 2723, Bay island to Pulo Obi. Var. about 2° E.*

nects with the Hau branch of the Mekong at Cho long Xuyen, as charted.

The town of Rach Gia is situated at the entrance of the river, is of some commercial importance, and is connected with the telegraph system. It is the chief town of the province of the same name. Small steam craft ply on the river; the current runs for 3 to 4 knots.

**Song Kailon or Kua Lon** discharges southward of the Rach Gia; its bar has a depth of about 3 feet at high water. There is communication with the Mekong and thence to Saigon by the several waterways from the Song Kailon by the Ba long canal for vessels under 6 feet draught under favourable circumstances. Kamao, the capital of the province of same name, may be reached by this route, but it is somewhat difficult, and the Song ong dok, near Cambodia point, seems preferable. Kamao is situated on the Ganh-hao, the mouth of which is between Cambodia point and the western mouth of the Mekong.

**TABLE HEAD** is a rocky headland, 600 feet in height, 15 miles westward of Teksia peak. The coast between forms a shallow sandy bay, having several streams falling into it. Just within Table head are some rocky hills attaining an elevation of 726 feet, and a mountainous ridge, which extends to near the town of Hong Chong.

**A rock**, 6 feet high, lies  $4\frac{1}{2}$  miles  $145^\circ$  true from Table head; a rock awash lies about 6 cables 233 true from it.

*Charts 2725, 2723.*

**BULUA ISLANDS.**—**Tekere or Minghue**, a cone-shaped island, 1,120 feet in height, in lat.  $10^\circ 1' N.$ , long.  $104^\circ 32' E.$ , 8 miles from Table head, is the largest of the Bulua islands, an archipelago of islands and rocks that extend westward and south-westward from Table head, and is an excellent mark for recognition. It is well wooded, inhabited, and contains a large number of wild boars.

**Rock.**—There is a rock above water about 4 cables south of its south point, with a sunken rock just beyond. At a mile eastward of the island is a bank with  $2\frac{3}{4}$  fathoms of water, and there is a patch of 2 fathoms close north-west of the north extreme of the island.

**Outer island** is the south-westernmost of the group,  $4\frac{1}{2}$  miles from Tekere island; a bank, with 5 fathoms and possibly less water, is charted as extending 3 miles south-west of it.

**Shark island** lies nearly 5 miles westward of Tekere; Tree rock lies  $2\frac{1}{2}$  miles northward of Shark island.

**Mekong reef**, with several rocky heads, and 6 feet least water, lies  $240^\circ$  true, half a mile from Tree rock. Saddle rock, and several dangerous patches, are charted northward of Tree rock.

*General chart 2414.*

*Charts 2725, 2723. Var. about 2° E.*

**West island**, the north-westernmost of the group, is 7 miles north-westward of Tree rock, and there is a patch of 3 fathoms at  $2\frac{1}{2}$  miles  $204^\circ$  true of it, but the depths apparently are but little greater in the neighbourhood.

**Hong Chong** (*Lat.  $10^\circ 9' N.$ , Long.  $104^\circ 36' E.$* ) is situated in the bay close northward of Cape Ongtai, the western extreme of Table head, and within the eastern islands of the Bulua group, which partly protect the small craft anchorage. It is of considerable importance for the export of pepper, large quantities of which are exported during the north-east monsoon period. Numbers of junks arrive here for that purpose about the end of the south-west monsoon period.

The town contains pepper warehouses, shops, and has a Custom house, police station, &c., stretching along the shore.

**Communication.**—There is a telegraph station connected with Saigon, &c., and postal communication with that place.

Small steamers call here for Hatien, to which there is also a road suitable for bullock wagons.

Storm signals are exhibited here.

**Supplies** of beef and fruit are obtainable, but the water is bad; there is no coal.

**Anchorage.**—The anchorage is good during the north-east monsoon, at which time all the trade is done. Small vessels and junks anchor as close off the town as their draught will permit, but there is no better water than 2 fathoms off the town. At  $2\frac{1}{2}$  miles southward of Cape Ongtai there are depths of  $3\frac{1}{2}$  fathoms, as there is also north-west of Hon Re, 3 miles westward of the town. During the south-west monsoon the anchorages are untenable, and the sea breaks around the islets in the offing, but there is some slight shelter under Hon Heo, the northernmost, for small craft.

The chart shows anchorage eastward of the Pirate islands, at this period, below mentioned.

**Donai, 1898.**—The master of the ss. *Donai* reported that his vessel appeared to touch bottom without stopping her way at  $9\frac{1}{2}$  miles south-westward of Tree island; an examination showed a uniform depth of  $4\frac{1}{2}$  fathoms, sand. Position, lat.  $9^\circ 57\frac{1}{2}' N.$ , long.  $104^\circ 19\frac{1}{4}' E.$

**Caution.**—Numerous other dangers and islets may exist in this neighbourhood, not shown on the chart; the locality has not been properly surveyed, and vessels when near these islands should navigate with caution.

**HATIEN or KANKAO RIVER**, situated about 16 miles north-westward of Table head, is only accessible to craft of very light

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

draught, there being only about 6 feet on the bar at low water. The bar extends  $1\frac{1}{2}$  miles seaward of the town, and the depths are not above 3 fathoms at 5 miles off, so that only vessels of light draught can approach the bar. On either side of its entrance are bluffs from 300 to 600 feet high, which, together with the gap dividing them, are remarkable from the westward. From this direction the town of Hatien, situated at the entrance (within which is a lake some  $2\frac{1}{2}$  miles in length, nearly filled with mud) may be seen at the distance of 6 or 7 miles.

This river communicates by the Hatien canal with Hau kiang, a branch of the Mekong above the citadel of Chaudok, and has depths varying from 3 to 10 feet.

**LIGHTS.**—Nui Nai (*Lat. 10° 21' N., Long. 104° 25' E.*).—On Loctri or Nui Nai point, from a masonry tower over a dwelling, 30 feet high, at an elevation of 205 feet above high water, a *flashing white* light is exhibited giving a short flash every *five seconds*, visible in clear weather at a distance of 21 miles, when bearing 330° true, through north and east, to 107° true, when not obscured by islands in the approach.

**Leading lights.**—From a small masonry structure on the pier end at the west entrance point to the Hatien river, a *fixed red* light is exhibited.

At  $5\frac{2}{3}$  cables 44° true from the preceding a *fixed white* light is shown at an elevation of 33 feet above high water. These lights in line lead between the banks into the river.

**Anchorage.—Directions.**—There is good holding ground southward of Nui Nai lighthouse, but the depth is under 3 fathoms at 5 miles off, so that it is only available for light draughts, and in the north-east monsoon period.

The lighthouse, the Pirate and Bulua islands are excellent marks for recognising the approach ; the track recommended is between West island of the Bulua group and the Pirate islands.

**River.—Beacons.**—The channel into Hatien river, about three-quarters of a cable in width, is marked by wooden beacons ; it should be approached southward of the outermost beacon, which is 26 feet high and surmounted with a spherical top-mark ; the channel within is marked on either side by stakes. It is stated that craft of 6 to 8 feet draught can enter the river, at times, at high water. No craft should attempt to enter without local knowledge.

**Tides.**—The time at which it is high water, and the amount of the rise of tide in this part of the Gulf of Siam, is very irregular and variable.

*General chart 2414.*

*Chart 2725, 2723. Var. about 2° E.*

**The town** of Hatien, on the west side of the entrance, is the principal settlement, and to it are attached all the French islands in the gulf, as far as Samit point, page 154.

**Communication.**—There is communication with Saigon by the canal viâ Chaudok, by very small steam craft and boats, and telegraphic communication with Saigon, Kamput, and Hong Chong.

**COAST.**—Between Nui Nai point, Hatien, and Kep point, 11 miles to the north-westward, the coast is low, and in the approach are the Pirate islands; the channel between is only navigable for craft of very light draught.

Midway between the points is the Kompong trach, available at high water for small junks. There is a bridge over it about three-quarters of a mile up; the town of same name is about 8 miles up. At a mile south of the entrance is Pnom Lok, or Luk Son, with a Custom-house and a missionary establishment.

**PIRATE ISLANDS.**—This group extends for a distance of about 13 miles southward of Kep point, and lies on the north side of the approach to Hatien.

Peaked island, the northernmost, is 504 feet in height and lies about  $2\frac{1}{2}$  miles off Kep point; good water and wood are plentiful here.

South Pirate (*Lat. 10° 15' N., Long. 104° 17 $\frac{1}{2}$ ' E.*), the southernmost, is very small and surrounded by a reef which extends to the distance of about half a mile on its north side. Great Pirate island lies 4 miles north-north-east of it.

Rugged rock, 6 feet high, at  $2\frac{1}{2}$  miles north-west of Great Pirate, is the west extreme of the group. Within the 3-fathoms contour encircling this group are numerous shallow patches of which the chart will afford the best information. The passage between them and the shore is only adapted to coasting craft with local knowledge.

**Anchorage.**—There is anchorage during the south-west monsoon period for small craft, in about  $3\frac{1}{2}$  fathoms, about half a mile off the east end of Great Pirate island; also at 2 miles eastward of North Pirate in about 4 fathoms. In the north-east monsoon, there is anchorage in 3 fathoms under the south side of Peaked island, and also southward of Kep point, in about  $2\frac{1}{2}$  fathoms, a prominent point northward of Peaked island, with Kep peak, within it, 963 feet in height. The navigator must use his own discretion when proceeding to any of these anchorages. The trade seems to be chiefly centred at Hong Chong in the north-east monsoon period, page 143.

**Brandon rock.—Rocks.**—Between Peaked island and Bumbi bluff, 11 miles north-west of it, there is a rocky plateau, on which the general depth is about 2 fathoms, but there is a small patch of 6 feet

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

295° true about 4 miles from Peaked island ; also Brandon rock, a pinnacle with 3 feet water, at  $3\frac{1}{2}$  miles 261° true of Peaked island, with Temple and Rocky islets farther westward.

**KOH TRON (Fu Kok)**, called by the natives Koh Dud, and by the French Fu Kok, divides the approach to Kamput into two channels. It is of a triangular shape, 26 miles in length, north and south, and 14 miles in breadth near the north end. The north-east side of Koh Tron is composed of table-land about 8 miles in length, and 1,978 feet in height at its north end, southward of which table-land is the Quoin, 1,017 feet in height ; and at the south end of the island there are some conical hills and bluffs. Round hill, the south-east extreme, is 394 feet in height, and only connected by a narrow isthmus with that extreme of the island. Gunong Kwala, at the north extreme, is 1,213 feet in height, and situated in *lat.* 10° 26' *N.*, *long.* 103° 58½' *E.* There are also some hills of moderate height near the north-west point ; the remainder of the island is low.

**Shores.**—The eastern shore is fringed with reefs and sunken rocks to the distance of from 3 to 4 miles, and the north side to one mile in places. The west side is almost clear ; Spread Tree islet (Hon do Moi), with rocks, outside it, lies nearly a mile from the shore at about 3 miles south of the north-west point. The principal dangers are referred to with the channels leading to Kamput. There are several fresh-water streams on the island.

**Villages.—Duong dong.**—There are several villages, the chief of which, and the capital of the island, Duong Dong, is on the Kua Giang, a stream on the western side of the island ; it is under the administration of Hatien, is the centre of an important fishing industry, and contains about 600 inhabitants. From the offing it presents an agreeable appearance, being surrounded by cocoanut trees. The entrance to the river is marked by a large rock surmounted by a pagoda. When the small native craft are entering at night a light is shown, *white* in the channel and *red* over the dangers.

The village of Kua Kan is southward of Duong Dong, northward of Square hill. It is a fishing village, about a mile up a stream which has a depth of 6 feet in the entrance at high water.

Fowls, eggs, and fish are plentiful on the island, but the natives are not over ready to sell.

The other villages and streams are of but little importance. Ham Ninh, on the east coast, is connected with Duong Dong by a road. Bai Dok, northward of it, is a fishing village, and sampans are constructed here. Retram, on the north coast, is practically abandoned.

**Communication** with Hatien is maintained by a small steam craft and by junks, interrupted during south-west monsoon period.

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

**Anchorage.**—There are anchorages on all sides of the island, according to the prevailing monsoon. *See the chart.*

**An Thoi.**—A group of islands extends about 7 miles southward of Koh Tron, the highest being Hon Dua, 326 feet, at half a mile southward of An Thoi village at the south extreme of Koh Tron. Omega or Hon Trang, is the south-westernmost of these, and from it a reef projects southward for a quarter of a mile. Hon Mong Thai is the south-easternmost, at  $1\frac{1}{2}$  miles eastward of Omega. Hon Thom, 328 feet high, is the largest, near the centre of the group. Dangers extend 4 miles east-south-eastward of Round hill, the south-east extreme of Koh Tron.

There are channels with apparently deep water between the islands, but they should not be used, as dangers exist other than those shown on the charts.

**Light.**—On the western point of An Thoi bay, a *fixed red* light is exhibited from an iron column, at a height of 131 feet above the sea, visible about 6 miles over an arc of  $214^\circ$ . Limits not given.

**The Brothers.**—East and West Brothers are two islets 3 miles apart, and 439 and 406 feet respectively in height, lying off the south point of Koh Tron,  $5\frac{1}{2}$  miles south-eastward of the An Thoi island. There are three rocks southward and westward of the West Brother; the south-western and largest is Table rock, distant one mile and about 20 feet high; the south-easternmost, at about the same distance, is 5 feet high, and the other, 3 feet high, is distant about 2 cables. They are all apparently steep-to.

**KAMPUT APPROACHES.**—From Kep point the coast westward forms several shallow bays to abreast Middle island, a distance of about 30 miles; in the first of these bays is Kamput or Kam-pot town, on the western branch of the Kompong Bai.

Shallow water fronts the whole of this coast, extending southward of Bumbi bluff, approach to Kamput, for a distance of 5 miles, and eastward of the meridian of the bluff for a distance of 21 miles.

It may be approached from southward or westward; the latter is available for all classes of vessels, as hereafter mentioned, whilst the southern has many dangers.

**Aspect.**—The approach is easily recognised by Koh Tron, the large island which divides the approach. The Elephant range north-westward of Kamput is very striking, being 3,200 feet in height. The Paps over Bumbi bluff, about 300 feet in height, and Bumbi cone (Pnom Sor), about 8 miles northward of them, are conspicuous from the channel.

*General charts 2414, 2660a.*



*Charts 2725, 2723. Var. about 2° E.*

**DANGERS.**—The islands and dangers on either side as far northward as Pulo Sisi have been described.

**Pulo Sisi**, or the Twins (*Lat. 10° 17' N., Long. 104° 13' E.*), are two islets covered with trees and connected by a reef of rocks at the south extreme of the bank, which extends some 21 miles southward of Bumbi bluff, at the entrance to Kamput, and forming the eastern side of the approach; the northern islet is 213 feet high, and lies about 238° true 5 miles from South Pirate island.

**Rosita rock**, on the same bank, lies 328° true,  $4\frac{3}{4}$  miles from Pulo Sisi. It is half a cable in extent, with 2 feet water on it and steep-to, and may at times be seen from aloft by the discoloured water.

**Clearing mark.**—Bumbi cone in line with east side of Bumbi bluff, bearing 0° true, leads westward of both these dangers in not less than  $2\frac{3}{4}$  fathoms water.

**Rocky islet**, 26 feet in height, lies on the same bank about 4 miles southward of the Bumbi bluff, and Temple islet, about  $1\frac{1}{4}$  miles 103° true of it; at 8 cables 219° true from Temple islet is a rock with 2 feet water.

**SOUTH CHANNEL to Kamput.—Directions.**—The Brothers, with Pulo Dama, form the limits of the southern approach to Kamput; farther northward Pulo Sisi and Rosita rock form the eastern side of the channel, and the shallow water extending some 4 miles off Koh Tron, the western. The channel is not recommended for vessels about 15 feet draught. Vessels may, if necessary, pass northward of the Brothers, but they should not approach Round hill (the south-east point of Koh Tron) nearer than 5 miles, as a rocky ridge with 3 fathoms and less extends east-south-eastward  $4\frac{1}{2}$  miles from the point.

Bearings of Pulo Dama islands, the Brothers, Pulo Sisi, and of the conspicuous peaks of Koh Tron, should suffice to keep a vessel westward of the doubtful Donai shoal and of Rosita rock. Gunong Susu, or the Paps, on Bumbi bluff, bearing 2° true, leads westward of Rosita rock; it will probably be visible when approaching the rock, and a better mark than that next mentioned. From aloft, in clear weather, Bumbi cone in line with the east extreme of Gunong Susu, bearing 0° true, also leads westward in about  $2\frac{3}{4}$  fathoms; this leading mark will also lead to the anchorage in  $3\frac{3}{4}$  fathoms,  $1\frac{1}{2}$  miles southward of Bumbi bluff, or anchorage may be taken abreast and westward of Rocky and Temple islands in a little deeper water.

Sailing vessels working in must be guided by the lead and the chart,

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

observing that the water shoals suddenly on the edge of the reef extending from the shore south-east of the summit of Koh Tron.

**WEST CHANNEL to Kamput.**—For vessels above 15 feet draught, the channel northward of Koh Tron should be taken, as the depths are not less than 6 or 7 fathoms throughout, whereas the channel eastward of Koh Tron is shallow. Vessels of or above moderate draught cannot approach within 7 miles of Kamput.

**Islands and dangers.—Tian Moi**, or Water island (*Lat. 10° 25' N., Long. 103° 47' E.*), is a good mark by which to recognise the entrance of the West channel. This island is 713 feet in height at its northern end, and has some fishermen's huts on the south side. The bay on the north shore within Water island and the coast near Kamput, is fronted by a shallow flat to the distance of 5 miles in places, as before mentioned.

**Middle island (Phu du)** lies between Water island and the mainland; it has two peaks, the northern one being 575 feet in height. A rocky patch with a depth of 5 feet lies 4 cables 196° true from the south point of Middle island.

The entrance of the West channel between Water island and Koh Tron is  $2\frac{1}{4}$  miles wide, with Flat rock just within it, situated two-thirds of a mile from the north-west point of Koh Tron; a rock, which dries, lies midway between Flat rock and the point.

**Clump island (Hon Trai Boi)**, 60 feet high, covered with trees, lies 2 miles south-westward from the same point, with a shallow patch at 4 cables eastward of it.

**Channel island (Hon Ran)**, 48 feet high, lies in the entrance, nearly a mile northward of Clump island.

**Cape Clear rock**, a pinnacle, with 4 feet water, lies on the north side of the fairway, with the east extreme of Water island bearing 311° true, distant a little over a mile.

The ground is foul to the distance of half a mile off Kwala point, the north extreme of Koh Tron, and a number of rocks, 20 feet high, extend about 2 cables from the point, having others near them under water. There is a patch of  $1\frac{3}{4}$  fathoms, situated  $1\frac{1}{2}$  miles 359° true from Gunong Kwala, with depths of 8 to 12 fathoms around.

**Directions.**—The fairway is close northward of Channel island and Flat rock, thence passing 2 miles or more northward of Kwala point to avoid the  $1\frac{3}{4}$ -fathoms patch off and the shoals eastward of it. The channel eastward of Clump island and southward of Flat rock is not recommended, as the ground is foul between them and Koh Tron, and the set of the tidal streams irregular.

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

Caution should be used in standing towards the edge of the northern bank when approaching Kamput river, as it is steep-to and rocky.

**Anchorage.**—Large vessels cannot proceed more than 5 or 6 miles eastward of Kwala point or within about 7 miles of Kamput. Small craft bound for Kamput should haul south-eastward from abreast Kwala point and keep it bearing northward of 272° true until Gunong Susu on Bumbi bluff bears about 358° true, or Bumbi cone is in line with the east side or lower part of Gunong Susu, as when coming by the southern channel, which mark will lead to the anchorage, in 3½ fathoms, with Kep point hill bearing 103° true.

Good anchorage will be found in the north-east monsoon period on the north-west side of Tian Moi or Water island in a depth of 4 fathoms, at a quarter of a mile from the shore, avoiding the rock charted southward of Phu du or Middle island; and all vessels intending to remain any length of time at Kamput would do well to anchor here and complete their water. The watering place is in a sandy bay on the north-west side of Tian moi; it is a fine running stream, and as the beach is very steep the water is easily embarked. (The water is now said to be good at Kamput.)

**Kamput or Kompong Bai** (*Lat. 10°34' N., Long. 104°9½' E.*) is the chief town of the province of Cambodia, which stretches from Hatien to the border of Siam.

It is situated on the western shore of the western entrance of the Kompong Bai, about 3 miles above the Paps on Bumbi bluff. and consists of about 500 houses; the neighbourhood is thickly populated, and there are numerous creeks intersecting it.

The principal traders are Chinese who visit the place in junks which lie in the creeks near the town.

The town is becoming of increasing importance as a centre of the pepper trade; sugar cane and rice are largely grown, as the soil is very fertile. The population is composed of Cambodians, Chinese, and Malay fishermen.

The residence of the Administrator is about 2½ miles above the Custom house situated at its mouth.

**The river.**—There is a channel on either side of the island in the fairway westward of Bumbi bluff. The western of these known as Grand pass is the deeper of the two. The bar fronting them has a depth of nearly 2 feet at low water, but within it the water deepens to 12 feet and more. The channel over the bar is marked by stakes, but no small craft should attempt to enter without local knowledge. A boat can cross the bar at all times when the water is smooth, but during the south-west monsoon period the sea breaks along the whole coast at

*General charts 2414, 2660a.*

*Charts 2725, 2723. Var. about 2° E.*

times. Junks are sometimes detained in the river by want of water on the bar. The eastern branch is only available for canoes.

**Supplies.—Telegraph.**—Kamput is connected with the telegraph system. Coastal steamers call here and at Hatien. There is a fairly good market, beef and other supplies are obtainable, and the water is good.

**Tides.**—It is high water, full and change, at Rocky island, off the entrance of Kamput river, at 4h. 0m., springs rise about 4 feet. The streams here, as in most other parts of the gulf, run for 12 hours near the full and change, subject to great irregularities.

**Winds.**—During the months of March and April the winds are usually from S.E. with strong squalls from N.W. to E.N.E. at times. The temperature at that period is about 86°, sometime reaching 90°.

**COAST.—Smaït river** is at the head of the bay situated between Kamput and Middle (Phu Du) island, western entrance to Kamput; the village of same name, with 1,200 inhabitants, is about 4 miles up; there is a depth of about 1½ feet in its approach.

**Datsap river**, northward of Middle island, has the Custom house of Sre cham at its entrance. Light-draught junks enter it, and there is a considerable export of rice from it.

The town of Dat Sap is about 6 miles up, and westward of it is Riem and Riem bay.

*Plan of Riem bay on 3727.*

**RIEM BAY**, situated on the north side of the western approach to Kamput, is about 2½ miles in extent, with depths of 2½ to 3½ fathoms over a mud bottom. Four islands lie in the entrance, named after their respective situations; North-west, Middle, South-west, 344 feet high, and Bay island, 377 feet in height, at its north-west extreme. Round island lies northward of North-west island, and Channel island south-eastward of Bay island. Reefs fringe the islands, as shown on plan.

The bay, though exposed to the south-west monsoon, affords fairly secure anchorage at that time off the north-east extreme of Bay island.

**Dangers.—White rock** is situated on a ledge of rocks extending half a mile 204° true of the north point of the entrance. Between Middle island and the north-west extreme of Bay island are two patches of 3 fathoms, but the water is not much deeper in their neighbourhood.

At half a mile 13° true of the Custom house on the north-east extreme of Bay island is a patch of 6 feet, with 2 fathoms around it.

**Anchorage.—Directions.**—Vessels under 15 feet draught can enter by any passage other than that eastward of Channel island in the south approach.

The best position is at the north end of the channel between Bay and Channel islands, in about 5 fathoms, with the Custom house 232° true, distant 2½ cables; if proceeding further into the bay by

*General charts 2414, 2660a.*

*Plan of Riem bay on 3727. Var. about 2° E.*

this channel, the rock with 6 feet water in the fairway must be avoided, passing westward of it; the Custom house bearing eastward of 171° true clears it.

**Town.**—There are native villages on the shore, and which is inundated at times. The town or village of Riem is about 3 miles up the river of that name, which has a least depth of 2 feet for about  $2\frac{1}{2}$  miles up, above which it nearly dries at low water. The neighbourhood produces pepper, rice, &c., but it is apparently shipped from Dat Sap, which river adjoins Riem, and discharges northward of Middle island (Phu du), as before described.

*Chart 2722, Koh Kut to Bay island.*

**OFF - LYING ISLANDS. — RONG SAM LEM** (Lat.  $10^{\circ} 35' N.$ , Long.  $103^{\circ} 17' E.$ ), the southernmost of a chain of islands in the estuary of Kampongsom river, is  $5\frac{1}{4}$  miles in length, north and south, 780 feet in height at its north end, and wooded; its western and south-east coasts are steep-to.

The island is unhealthy, but is inhabited and thickly wooded. An islet lies off its north end, between which and the island is a rock with less than 6 feet water.

**A patch** of  $4\frac{1}{2}$  fathoms lies  $1\frac{1}{4}$  miles eastward of the north point of Saracen bay, with 9 to 10 fathoms around it.

*Plan of Saracen bay on 2101.*

**Saracen bay**, on the east side of Rong Sam Lem, almost divides it into two parts, and affords good anchorage, the shores being high and the entrance fronting the mainland. The bay is 2 miles in length and one mile wide in the entrance, with depths of 5 to 6 fathoms over a considerable portion of it. The bottom is flat and generally sandy, decreasing in depth towards the shore. There are no dangers in the southern arm, at the head of which is a sandy beach, but the southern shore of the northern arm is encumbered with sunken rocks southward of the two rocks shown on the plan.

**Shoal.**—A patch of  $1\frac{1}{2}$  fathoms is situated 2 cables off the north shore of the bay, bearing  $248^{\circ}$  true, distant  $7\frac{1}{4}$  cables from the eastern extreme of the northern point.

**Anchorage.**—There is good anchorage in about 4 fathoms about 3 cables off the cascade in the southern part of the bay during the south-west monsoon period. In the north-east monsoon the northern anchorage is the more sheltered, as there is a certain amount of fetch from the 25 miles of open water eastward of it.

Wood and fresh water may be obtained at the head of the bay without much difficulty at high water. There is also a convenient watering place just northward of the bay, where the beach is steep-to. The water, although it looks good, is at times impregnated with decaying vegetable matter, and is better avoided for drinking purposes.

*Chart 2722, Koh kut to Bay island.*

**Mangrove island** lies about midway between Rong Sam Lem  
General charts 2723, 2722, 2414.

*Chart 2722, Koh Kut to Bay island. Var. about 2° E.*

and the mainland, with a sunken rock half a mile westward of it. A patch of  $4\frac{1}{2}$  fathoms lies nearly one mile north of the east point of Mangrove island, and another patch  $4\frac{1}{2}$  fathoms at  $1\frac{1}{2}$  miles southward of the same point.

**Elbow island** lies close to the main shore eastward of Mangrove island, with Square rock, above water, about a mile north-west of it. There is a patch of  $4\frac{1}{2}$  fathoms at three-quarters of a mile southward of Elbow island, and shallow water extends about half a mile off the point southward of it.

**Rocks.**—At one mile north-eastward of Elbow island is a reef which never covers, and at 4 cables  $64^\circ$  true of the reef is a patch of  $2\frac{3}{4}$  fathoms. At 2 miles north-eastward of the reef, and about the same distance off-shore, is a rock with less than 6 feet water.

**KOH RONG**,  $2\frac{1}{4}$  miles northward of Rong Sam Lem, is 8 miles in length, north-west and south-east, 5 miles in breadth, 1,158 feet in height, and wooded.

Its western and northern sides are apparently steep-to, but a bank with depths of 3 to 5 fathoms (one patch of  $1\frac{1}{2}$  fathoms) extends about  $3\frac{1}{2}$  miles north-east of the north-east extreme of the island, and another with from 4 to 5 fathoms projects about  $2\frac{1}{2}$  miles south-eastward from its south-east side.

**Anchorage.**—On the east side of the island vessels may lie sheltered in the south-west monsoon period in depths of 4 to 8 fathoms, and vessels can approach it from either northward or southward of the island.

**Channel island** lies in the northern approach to Koh Rong anchorage; its north side is fringed with coral to a short distance.

**Middle island** is between Channel island and the northern shore, Samit point; a shallow bank extends about  $1\frac{1}{2}$  miles eastward of it. North islet lies off its north side, with shallow patches between.

**Plate islet** lies between North islet and Samit point; rocks extend eastward of it, and the ground between it and Samit point is foul in places.

**Rocks.**—There is a rock above water about midway between Middle island and the point of the bay 9 miles eastward of it, with a sunken reef on its south side; there is another rock or reef about a mile north-east of it.

**Kamongsom bay**, within the island just described, is about 22 miles wide, with depths of 7 to 8 fathoms, apparently free from dangers, other than those mentioned with the islands. At 7 miles eastward of Koh Rong it is reduced to a width of 14 miles, within which is the estuary of Kamongsom river, which has not yet been charted. Touffu rock is a conspicuous object in the bay, situated (several miles) north-north-eastward of Elbow island: a reef with rocks with 5 to 8 feet on it extends 8 cables north-westward of the rock.

The north shore of the bay is mostly low with mangroves, but it rises to 300 feet at the estuary of the river; on the south side it attains

*General charts 2723, 2722, 2414.*

*Chart 2722, Koh Kut to Bay island. Var. about 2° E.*

an elevation of 500 feet. There are several villages around the shores of the bay.

The town of Kampongsom is about 30 miles up the river or about 55 miles from Koh Rong. It is a place of considerable trade.

The river Sré Umbel also discharges into this bay at 15 miles 15° true from Depart island, not charted. It is navigable for junks to near Kompongs leu, on the line of route from Pnom penh to Kamput. Sré Umbel is the capital town of the province of same name.

**Directions.**—The channel from the southward between Rong Sam Lem and Mangrove island reef is  $3\frac{1}{2}$  miles wide, with depths of 11 to 13 fathoms; that between Rong Sam Lem and Koh Rong is nearly 2 miles wide, with a depth of about 10 fathoms; both are safe, but the bottom in the latter is rocky and not suitable for anchoring. The channel between Koh Rong and the islet north of it is  $1\frac{1}{2}$  miles wide, with depths of  $5\frac{1}{2}$  to 7 fathoms. They are all easily available by a steam vessel. Above the soundings charted, a vessel must proceed with great caution until such times as a chart is available.

**COAST.—Samit point** (*Lat. 10° 53' N., Long. 103° 3' E.*), 500 feet in height, is the north point of approach to Kampongsom bay; rocks above water extend  $1\frac{1}{2}$  miles north-west of it.

Between Samit point and Koh Kong, 23 miles to the northward, the land is hilly near the coast, forming rocky bluffs to seaward, with sandy bays between. These bays generally have deep water in them; and afford good anchorage with off-shore winds. The highest and most remarkable hill about this part is the Quoin, 1,155 feet in height.

**Koh Samit.**—About 2 miles north-west of Samit point is Koh Samit, about  $1\frac{1}{2}$  miles in extent, and 400 feet in height. It is the southernmost islet of a chain which extends 12 miles northward and nearly parallel with the coast, below mentioned. (Another island of the same name lies about 75 miles north-westward, page 161.) Between the island and the mainland the water is shallow, but there is shelter for fishing craft. Two other islands are situated at 3 and 6 miles northward of Koh Samit within the 5-fathoms contour line, and high rocks extend  $1\frac{1}{2}$  miles north-west of Koh Samit.

A round island, 500 feet in height, lies about 4 miles northward of Koh Samit, apparently steep-to.

**Table rock**, 200 feet high, lies 3 miles north of the round island, with a patch of  $4\frac{1}{2}$  fathoms off its south-west side. Some islets, 300 feet in height, lie south-west of the point, 300 feet in height, westward of Quoin hill.

**OFF-LYING DANGERS.**—The dangers, real and reported, as far northward as Koh Samit, lat. 10° 54' N., have been described on pages 139, 140. The following lie off the coast between that island and Koh Kong.

*General charts 2414, 2660a.*

*Chart 2722, Koh Kut to Bay island. Var. about 2° E.*

**Kusrovie rock** (*Lat. 11° 6½' N., Long. 102° 46½' E.*), situated 21 miles north-westward from Koh Samit and 15 miles from the south extreme of Koh Kong, is about 150 yards in diameter and 36 feet high. Its sides are shelving, and isolated rocks extend half a cable from it.

**Ubon Boratit shoal**, situated 11° true 9 cables from Kusrovie rock, is formed of coral and sand, with depths varying from one to 8 fathoms, the least water upon it being 5 feet.

A patch of 3 fathoms lies 238° true, distant 4½ cables from the shoal. There is deep water between these two shoals, and between them and Kusrovie rock.

**Ellen Bangka rock**.—In 1870 the Netherlands India barque *Ellen Bangka* struck twice on a shoal on which there was only 11 feet water. At the time, the vessel was stated to be 5 or 6 miles north of Kusrovie rock, which was visible from the deck; the approximate position of the danger is lat. 11° 11' N., long. 102° 47' E.

*Chart 2721, Cape Liant to Koh Kut.*

**KOH KONG** (*Lat. 11° 20' N., Long. 103° 0' E.*), 21 miles northward of Koh Samit, is a table-topped island, 11 miles in length, north and south, 3½ miles wide, 1,500 feet in height at its north end, and covered with trees. It has some sandy beaches along its western shore, which is fairly steep-to, but the island offers no sheltered anchorages or other advantages to shipping. It is inhabited occasionally by fishermen.

Within Koh Kong there is a shallow bay into which numerous small rivers discharge; they are not generally approached excepting in the flat-bottom boats of the country. The channel into this bay from the southward lies close along the eastern side of the island.

The mainland within Koh Kong is very low as far as it is visible to the eastward, but it rises to the northward with great regularity until it joins the high table-land abreast Koh Kut.

Phra Chanta Nakara, the point on the north side of the channel northward of Koh Kong, has a cone islet at about half a mile north-west of it.

**Klong Koh Paw**.—Two streams of some size enter the sea at 6 and 8½ miles northward of Koh Kong; the northernmost, named Klong Koh Paw, has a depth of 5 feet on its bar at low water, and may be known by a remarkable mound, 400 feet in height, forming a bluff on the coastline, 2 miles northward of the entrance. A French Customs officer is stationed at Bankok paw, 8 miles up the river, which is not navigable farther up. The southern stream, Klong Kasof, also has 5 feet on its bar at low water. A quantity of dried and salted fish is exported. The edge of the shallow bank off these streams is steep-to and 2½ miles from the shore.

**The COAST**, from the Klong Koh Paw, trends in a north-north-west direction 40 miles to nearly the head of Tung Yai bay,

*General charts 2414, 2660a.*



*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

with regular depths off it. With the exception of two rocky bluffs, the northernmost of which is Lem Kratt, the land near the sea is low, and fringed by a sandy beach pierced by numerous small streams; but parallel to the coast, at the distance of 2 or 3 miles inland, a tableland rises with great regularity to the height of more than 2,000 feet. This mountain mass rises at the distance of a few miles north-east of Tung Yai river, and falls again at the Klong Koh Kong; one of its most elevated points was found to be 4,000 feet in height.

**KOH KUT**, lying 16 miles off the coast, and 25 miles north-westward of Koh Kong, is the southernmost of a group of islands extending in a direction parallel to the coast for a distance of 40 miles and fronting the southern approach to Tung Yai bay. It is a high level island with steep cliffy sides. There are two small conical peaks in its southern portion, the highest of which (the northernmost) is 1,171 feet in height.

Good anchorage for small craft will be found in a bay near the north-west end of Koh Kut, with a stream of fresh water running into it. The bay, on the eastern side (*Lat. 11° 44' N., Long. 102° 33' E.*), would afford shelter in the south-west monsoon period. Fresh water may also be obtained on this side about a mile from the north point of the island.

**Koh Mak**, lying 4 miles north-west of the north end of Koh Kut, is 4 miles in length, east and west, and generally rather low, excepting its west extreme, which is a rocky headland, 350 feet in height. The island, Koh Loi, 3 miles westward of Koh Mak, is 800 feet high.

A coral flat extends  $4\frac{1}{2}$  miles north-eastward from Koh Mak, on which is the islet of Koh Kahdat, 190 feet in height. At the north-eastern extreme of the flat is Richelieu patch, with a depth of 2 fathoms.

Koh Mak is inhabited by fishermen engaged in collecting bêche-de-mer. There is a channel 3 miles wide between the archipelago of islands south of Koh Chang and Koh Mak, with apparently not less than 5 fathoms water; and there is a good channel  $3\frac{1}{2}$  miles wide with depths of 9 to 10 fathoms between Koh Mak and Koh Kut.

**Koh Chang**, situated 7 miles north-north-westward of Koh Mak, is 16 miles in length north-west and south-east, and about 6 miles in breadth, having several peaked hills intersected by rocky and precipitous ravines. The highest part of the island (a table peak near its centre) is 2,446 feet in height, and situated in *lat. 12° 14' N., long. 102° 19' E.* Notwithstanding the numerous islands and rocks that fringe Koh Chang, no dangers were discovered near its shores but what were apparent. Fresh water can be obtained on the western side of Koh Chang, about 3 miles from the north point.

At the village of Ban Koh Chang, on the eastern side, is a Customs-house.

*General chart 2414.*

*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

**Reported danger.**—A sunken rock was reported in 1889 to exist about 23 miles west of the north end of Koh Chang, as charted.

**TUNG YAI BAY** lies within Koh Kut, Koh Chang, and the islands between them, and affords good anchorage in depths of about 4 fathoms, with Lem Nam bearing about 272° true, distant 4 miles; there are depths of 6 fathoms farther southward. Sunken rocks extend upwards of a mile southward of Lem Nam and nearly the same distance north-eastward of that point, all lying within the 3-fathoms line fronting the bay.

The head of the bay has depths of less than 3 fathoms for a distance of 4 miles outside High Tree point, which is  $4\frac{1}{2}$  miles from its head.

**Directions.**—The widest approach to Tung Yai bay is that from the southward between Koh Kut and the mainland, in which there is sufficient water for vessels of any draught, but a good look-out should be kept as the soundings taken are but few.

The entrance immediately north of Koh Kut is also good, being  $3\frac{1}{2}$  miles wide, with depths of 9 to 10 fathoms.

The channel between Koh Mak and the several islands north of it has apparently not less than 5 fathoms, and is 3 miles wide. A fairway patch of  $5\frac{1}{4}$  fathoms, with 8 fathoms around, is named Vesatri bank.

These islands are Koh Kra, 800 feet; Klum, 600 feet; Bidang, 430 feet; Chan, 700 feet; Ile du Pic, 935 feet high; and Le Chameau. Le Soulier rock, apparently above water, lies about a mile northward of Le Chameau, and there is a rock, 148 feet high, about three-quarters of a mile eastward of Le Chameau.

The channel from the northward between Koh Chang and the mainland is referred to with Lem Ling, below.

**Tung Yai river** falls into the head of the bay; it is only navigable for boats. The village of Takekian is charted about 4 miles above the entrance, with Muong Krat or Ban Prah about  $1\frac{1}{2}$  miles westward of it. On the eastern side of the shallow part of the head of Tung Yai bay is the village of Tem.

**Lem Ling** is situated on the north side of the north-west entrance to Tung Yai bay. A mangrove islet lies close to Lem Ling, and the ground is foul for a short distance off, and also for more than a mile along the shore to the northward; but Lem Ling is quite clear to the south-westward.

**NORTH CHANNEL.**—This channel is  $2\frac{1}{2}$  miles wide between Lem Ling and the north-east extreme of Koh Chang, opening out to about 8 miles abreast the south-east end of the island; the fairway depth is about  $3\frac{1}{2}$  fathoms at low water. The channel with this depth is narrow abreast Jaune rock, where a prong with  $2\frac{1}{2}$  fathoms stretches off from Koh Chang.

**Dangers.**—Tung Yai bank extends about two-thirds of the width of the channel from the eastern shore, with a depth under 3 fathoms; near its middle and about a mile within its 3 fathoms edge is Jaune

*General chart 2414.*

*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

rock (Hin Mun Chang), a clump of black rocks which dries 5 feet. Les Frères, 197 feet high, lie in the fairway south-westward of Jaune rock.

**Buoy.**—A red conical buoy is placed in about 3 fathoms on the south extreme of the bank off Lem Nam.

**La Fourmi.—Light** (*Lat. 12° 10' N., Long. 102° 17' E.*).—La Fourmi rock, 4 feet high, lies in the fairway of the western entrance, 2 miles south-eastward of Lem Ling; a small rock with one foot of water lies three-quarters of a mile north-eastward of it, on the edge of the 3-fathoms contour of Tung Yai bank.

A *fixed white* light is exhibited, from a white beacon, on La Fourmi rock, at an elevation of 26 feet above high water, visible from a distance of 4 miles. *Unwatched.*

A *fixed white* light is also charted at Lem Ngop, the Government station north side of the channel, where also there is a Customs-house.

**Anchorage.—Directions.**—There is anchorage in about 4½ to 5 fathoms at about three-quarters of a mile south-eastward of La Fourmi light. There is no difficulty in reaching this anchorage; the lighthouse rock should be steered for bearing 101° true, passing from one to 2 cables south of it and anchoring when it comes in line with or open of Lem Ling.

Proceeding on to Tung Yai bay requires local knowledge in any craft above 15 feet draught.

**The COAST** from Lem Ling trends 20 miles north-westward to Lem Sing, the western point of entrance to Chentabun river. The shore between is low mangrove, and the depths are said to be less than charted. Koh Phroet, 5½ miles south-eastward of Lem Sing, is connected with the point abreast by a sunken ridge. This coast has a number of fishing villages.

**Koh Chik**, a cultivated island 349 feet in height, and nearly a mile in length, lies in the fairway of the approach to Wain creek, an inlet about half a mile in width in the entrance, at about 6 miles northward of Lem Ling; there is a smaller islet between it and the southern point of the inlet. In the fishing season (north-east monsoon) there are about 1,000 fishermen on Koh Chik.

*Sketch plan of Ban Yao river and Wain creek on chart 2721.*

**Wain creek** is approached over the bar with 1½ fathoms at low water, which extends 2 miles seaward of Koh Chik; at 2 miles within that islet, the depth is 6 fathoms. Here the inlet divides, the western arm trends northward, gradually reducing in depth to 2 fathoms at about 10 miles up, in the approach to Ban Yao, which town has 2,500 inhabitants. There is a boat channel leading to Chentabun river from near Ban Yao.

The eastern arm has from 1½ to 2 miles for about 5 miles, to near its head, where Bau creek enters it. The point which separates these streams has a shallow flat extending three-quarters of a mile south-west or seaward of it.

Both branches are between mangrove swamps, but rice fields commence at Ban Yao, in the western arm.

*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

**Alabaster rocks**,  $7\frac{1}{2}$  miles southward of the entrance of Chentabun river, are two small rocks, about 40 feet apart, lying nearly north and south from each other. The southern and larger one dries 3 feet at low water springs and is 14 feet in length; the northern one dries 2 feet. There is a depth of 2 fathoms between and around them with 5 fathoms at a short distance. Fishermen say they can trace a line of rocky bottom to Cone island.

From the Alabaster rocks, Cone island bears  $354^\circ$  true, distant 7 miles, and the southernmost of the three islands, Koh Kwan, 350 feet in height, abreast,  $62^\circ$  true.

*Plan of Chentabun river on 2721.*

**CHENTABUN RIVER.**—The position of this river may be recognised from a distance by Kau Sabap, a mountain, 2,990 feet in height, situated 10 miles north-eastward from its entrance; also by Cone island (Koh nam sau), 405 feet high, lying 2 miles westward of the entrance.

**Navigable depths.**—Koh Chula, or Bar island, lies in the entrance, and is surrounded by the flat with less than 2 fathoms water which extends from the eastern shore; rocks are reported to extend some distance south-west of it. Between it and the rocks which extend  $1\frac{1}{2}$  cables off the west point of entrance, is the channel  $2\frac{1}{2}$  cables wide into the river, with about 2 fathoms at low water; it is necessary to moor in the river as the streams are strong. Vessels of 12 feet draught go about  $1\frac{1}{2}$  miles above Paknam, to abreast the Roman Catholic chapel, south of Lem Pradoo, but the river is said to have silted up considerably.

**The town** of Chentabun is about 14 miles up; steam launches of about 4 feet draught can reach the town with local assistance. There is a French Resident here.

In Chentabun is the finest and largest church in Siam, built by the Roman Catholics of the province. Population between 6,000 and 7,000. It has a good market.

The village of Paknam, with a Customs-house and a market, is situated on the east side of the entrance.

**Light.**—A white occulting light every thirty seconds, thus:—light, twenty-five seconds; eclipse, five seconds; elevated about 280 feet above high water, and visible in clear weather from a distance of 12 miles, is exhibited from a red lattice-work structure on pillars, on the west side of the entrance to Chentabun river.

**Anchorage.**—A convenient anchorage for small craft, in a depth of 4 fathoms, may be obtained without the bar, with Koh Chula

*General chart 2414.*

*Plan of Chentabun river on 2721. Var. about 2° E.*

bearing 58° true, distant one mile. Fishing stakes are numerous on the banks. Fresh stock is scarce, but an abundance of good water may be procured in a small bay westward of Lem Sing.

**Tides.**—It is high water, full and change, at the entrance of the Chentabun at 10h. 0m., springs rise about 5½ feet. The highest tide occurs on the day after new moon. Here, as in the Bangkok river, the streams run for 12 hours at the full and change, and are subject to great irregularity.

**Telegraph.**—Chentabun is connected with Bangkok by telegraph.

**Trade.**—Pepper is grown nearly everywhere in Rayong province; coffee only around Chentabun; cotton does well; and rubber plantations are being developed; quantities of timber are shipped from the eastern ports of the gulf; matting, gamboge, &c., are articles of export. Chentabun has a considerable trade in precious stones.

Fishermen move from one shore to the other, depending on the monsoon. Stakes extend out to depths of from 2 to 6 fathoms in places along the coast.

*Chart 2721, Cape Liant to Koh Kut.*

**The COAST** north-westward from Chentabun river is generally flat, with hills in the distance.

Koh Saba (*Lat. 12° 30' N., Long. 101° 56' E.*) is a small island, 5 miles from Cone island, lying close off the west point of entrance to the River Kem Nu, which river has about 4 feet on its bar at low water.

**A reef**, consisting of three heads, which dry 3 feet at low water, and is steep-to to seaward, lies just within the edge of the bank which fronts the shore, 306° true, about 2 miles from Koh Saba.

**Parat bay**, north-westward of Koh Saba, is about 13 miles wide; the rivers Parat and Pa Sair or Pa Se discharge into it.

**Dangers.**—The eastern shore of the bay is fronted by a bank to the distance of 1¾ miles, on the edge of which, off Parat river, is Volant rock, which dries about 3 feet at low water.

Off the western shore the bank is foul and rocky and extends about 6 miles south-east of the west point of the bay. A sand patch with one fathom water lies close to its edge, 241° true, about 3 miles from Volant rock.

Three islands are situated on the prolongation of the bank southward; Koh Mon, the largest and outermost, in lat. 12° 34' N., long. 101° 41' E., is 6 miles off-shore; the others are named Mong Klong and Mon Ni; the channel is foul between them. The channel within Mon Ni is foul, and should be avoided. Mon Ni is inhabited, and there is a well on it, the water of which is bitter, and supposed to contain medicinal properties.

Loftus rock, situated 126° true about three-quarters of a mile from Koh Mon, is of coral, steep-to, with 1½ feet water over it, and 5 or 6 fathoms around.

*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

The native pilots report a rock, named *Hin ai eorp*, visible at half-tide, as lying in a direct line between *Mon Klong* and *Tung Kaben bay*, about 5 miles from the latter.

*Hin Lawp*, a rock lying  $94^{\circ}$  true, distant 6 miles from *Koh Mon*, dries 3 feet at low water springs; shoal water extends three-quarters of a cable to the eastward of it, with depths of 4 to 6 fathoms around.

**Pa Se river.**—The bar of this river has a depth of 5 feet at low water, with 3 to 4 fathoms within, but the river is tortuous. *Tan-kien* is situated about 6 miles up, and is a telegraph station. The principal export is pepper, amounting to about 7,000 piculs annually. There is plenty of big game in the neighbourhood.

**ALHAMBRA ROCKS**, lying with *Koh Mon* bearing  $13^{\circ}$  true distant  $8\frac{1}{2}$  miles, are coral patches  $2\frac{1}{4}$  cables apart in a north-east and south-west direction and steep-to, having 9 fathoms water between them. The south-western rock is nearly awash at low water spring tides, and the sea then breaks heavily on it in bad weather; the north-eastern rock has a depth of 6 feet.

**Buoy.**—A black conical buoy lies about  $1\frac{1}{2}$  cables south-eastward of the south-west rock; not to be depended on.

**Victory shoal**, composed of coral, was reported by the vessel *Victory*, in the year 1879, as being situated approximately in lat.  $12^{\circ} 18' N.$ , long.  $101^{\circ} 17' E.$

**COAST.**—*Koh Tulu* lies midway between *Koh Mon* and *Koh Samit*, 15 miles apart, with rocks extending half a mile south-east of it.

**Buoy.**—At  $1\frac{1}{4}$  miles north of *Koh Tulu* are two rocks 50 yards apart, dry at low water; a red buoy with topmark is placed on the north side of these rocks, but is not to be depended on.

**Koh Koi.**—Between these rocks and *Koh Samit* is *Koh Koi*, with *Koh Platin* northward of it, with rocks between and around them. Between *Platin* and the shore are sunken rocks, as charted. Craft should pass southward of *Koh Koi*.

**KOH SAMIT** is wedge-shaped,  $3\frac{1}{2}$  miles in length, and 424 feet in height at its north end, which is its widest part. It lies 3 miles off the shore of the bight eastward of *Lem Ya*, and is connected with it by a bank with less than 3 fathoms water, and nearly so with that extending from *Lem Ya*, distant  $1\frac{1}{4}$  miles. (Another island of the same name lies about 75 miles south-eastward, page 154.) There is a patch of 2 fathoms at about one mile north of the north-west extreme of *Koh Samit*, and one with less than 6 feet at half a mile off the north side of the island.

**Light.**—On the north-west point of *Koh Samit* a *fixed white* light is exhibited occasionally.

**Chong Samit** is the narrow passage between *Koh Samit* and *Lem Ya spit*, and possibly carries 3 fathoms water.

*General chart 2414.*

*Chart 2721, Cape Liant to Koh Kut. Var. about 2° E.*

**A rock**, 70 yards in extent, composed of boulders, is reported to lie in the fairway, with the north point of Koh Samit, bearing 53° true, distant 1½ miles. Another, with 10 feet water, is reported near the end of the spit extending from the western shore (1912) at about a mile north-east of it; they may be one and the same. Only those locally acquainted should use this channel.

**Tree islet** lies half a mile southward of Koh Samit, and half a mile beyond is Brown rock above water, with a sunken rock close eastward of it.

**Lem Ya** is 397 feet in height, and there is a range of conical hills extending from it 15 miles inland; the highest and northernmost is 2,470 feet in height. On each side of this headland the coast is low. A spit extends 1½ miles south-eastward of Lem Ya, forming west side of entrance to Chong Samit.

The village of Ban Pae lies about 2½ miles north-eastward of the point; it has a garrison of 250 marines.

**Bush rock**, 268° true, distant 2½ miles from Lem Ya, is composed of coral, steep-to, and dry at low water, with 4 fathoms around.

**Buoy**.—A black and white horizontally striped buoy is moored half a cable southward of the rock, but it is not to be depended on.

**COAST**.—The bay to the westward of Lem Ya is fringed with a sandy beach to its western extreme, Lem Sahemsan, or Cape Liant, distant 27 miles. Nearly midway, at about 1½ miles off-shore, is Koh Sakait with sunken rocks around it, but all lying within the 3-fathoms edge of the bank fronting the coast.

**Rayong**.—A stream, on which is the town of Rayong, discharges north-eastward of Koh Sakait; its mouth is continually shifting, and its bar is nearly dry at low water. A small *white* light is exhibited here when the mail steamers call, bi-weekly. The town has about 2,500 inhabitants. The principal products are pepper and gamboge.

About 5 miles westward of Koh Sakait are rocks above water, also within the 3-fathoms contour.

*Charts 2720, 2721.*

**CAPE LIANT** or **Lem Sahemsan**.—Cape Liant (*Lat. 12° 35½' N., Long. 100° 57' E.*) is the south-east extreme of the promontory forming the east point of the entrance of Bangkok bay.

**Light**.—On the south-east extreme of Cape Liant, a *fixed white* light is exhibited occasionally, visible at the distance of 6 miles in clear weather.

On approaching Cape Liant from the southward, the islands Chuen and Me san off it, being the highest land in the neighbourhood, will be first seen.

Hin Chalan, the outermost island, will not be observed until it is within the distance of 5 miles; it is a white rock, 40 feet high, and steep-to.

The channel between Hin Chalan and Chuen is 2½ miles wide, with deep water. The channel between Chuen and Me san is a mile in

*General chart 2414.*

*Charts 2720, 2721. Var. about 2° E.*

width, and deep; Sail rock, 45 feet high, lies in its western approach and Koh Ronkon, 118 feet high, at its eastern end. There are no dangers shown on the chart.

**Chong Me san**, the channel between Cape Liant and Koh Riat, is only a quarter of a mile wide, but is much used by coasting craft, and has apparently a depth of 4 fathoms. During springs the tidal stream runs with considerable velocity through it, so that it should never be attempted by a sailing vessel without a fair and commanding breeze.

**Buoy**.—A spit, with about 10 feet at low water near its extreme, extends one mile north-westward of Koh Me san, forming the south side of the entrance from the westward. A spit extends north-eastward of Koh Riat, south side of the eastern entrance; it is marked by a buoy, not to be depended on; the channel is northward of it.

On the north side are the shoals extending southward of Koh Pra and Koh Yoh Nok, as charted; the mainland is bordered by shallow water to a short distance beyond the points of the bays. North-eastward of Cape Liant is a reef which dries at times; position not given.

**LIGHT.—Koh Chuen** (*Lat. 12° 31' N., Long. 100° 56' E.*).—From Phahurat lighthouse painted white on the summit of Koh Chuen, is exhibited, at an elevation of 466 feet above high water, a group flashing white light with a period of twenty seconds, showing thus:—flash, one-and-a-half seconds; eclipse, three seconds; flash, one-and-a-half seconds; eclipse, fourteen seconds. It is visible in clear weather from a distance of 29 miles.

A sector of fixed red light is shown from the same lighthouse over Hin Chalan, to the southward.

*Chart 2720, Kih Ta Kut to Cape Liant.*

**Sheltered bay** lies between the point situated 3 miles northward of Cape Liant and Lem Putau; it is about 4 miles wide, with good anchorage in about 3 fathoms water, sheltered by several islands fronting its entrance, mentioned below and with Koh Pra.

The eastern horn of Sheltered bay may be known by a cone-shaped hill 454 feet in height. Koh Tki lies south-westward of the conical hill, and has a reef extending nearly to the rock above water three-quarters of a mile northward of it. A patch of  $3\frac{3}{4}$  fathoms lies about a mile 255° true of Koh Tki. The best entrance apparently is between Koh Tki and the  $3\frac{3}{4}$  fathoms patch, and from thence eastward of Koh Mu, but it is apparently only available for vessels of light draught.

**Sa ta hip**, at the head of the bay, is a post and telegraph station; the place is growing fast, as are all the places where steamers call regularly. See channels, with Koh Yoh Nok, on page 164.

*Plan of Koh Pra anchorages on 3727.*

**KOH PRA**, 516 feet high, and about half a mile in extent, is situated on the western side of Sheltered bay, southward of Lem Putau, a bluff headland, 565 feet in height.

**Light** (*Lat. 12° 38' N., Long. 100° 51' E.*).—From an iron column  
*General chart 2414.*



*Plan of Koh Pra anchorages on 3727. Var. about 2° E.*

10 feet high on the north-west extreme of Koh Pra, is exhibited, at an elevation of 55 feet above high water, a *fixed red* light visible from a distance of 8 miles in clear weather.

**Buoyage.**—A black and white vertically striped buoy marks the edge of the shoal at the north-east extreme of Koh Pra, and a black and white horizontally striped buoy the edge of the shoal, 2 cables south-east of the same extreme.

**Anchorage.**—There is an outer anchorage in about 6 fathoms at from a half to one mile westward of the light.

Northward of the quarantine station at the eastern end of Koh Pra there is anchorage space about 3 cables in length and in breadth, with depths of  $2\frac{1}{2}$  to 6 fathoms, with not less than  $3\frac{1}{2}$  fathoms in the approach from seaward, but the channel is less than a cable wide at low water with that depth.

South-eastward of the quarantine station there is anchorage in 4 to 5 fathoms over half a mile in extent. The depth is not less than  $2\frac{1}{2}$  fathoms at low water in the approach over the bar southward of Koh Pra; vessels can approach this anchorage either northward or south-eastward of Koh Pra. The southern anchorage is apparently the quarantine anchorage.

The tidal streams are charted from one to 2 knots, the flood north-west and west through these anchorages and the ebb in the opposite direction.

**Quarantine station.**—There is a quarantine station on Koh Pra, and ships arriving from ports declared to be infected by the authorities of Bangkok call here for pratique; all vessels except regular traders who are sure of the port they left being clean are advised to call here.

Other so-called pratique stations are Koh Sichang, during south-west monsoon, and Ang Hin, during north-east monsoon; Paknam, and Bang Kolem in Bangkok river, only grant pratique if the port you come from is declared clean by the Siamese authorities; the Bill of Health is nothing to go by. *See* pages 556-558.

**Signal station.**—There is a signal flagstaff on the summit of the island.

Vessels which, for one reason or another, are unable to enter the quarantine anchorage, are required to fly F.G.L. flags of the International Code, in addition to the quarantine flag.

The answering signal W.N. will then be hoisted from the flagstaff, and the quarantine officer will board such vessels as soon as possible.

**Koh Yoh Nok**, 348 feet in height, lies about a mile southward of Koh Pra; it is nearly connected with Koh Yoh Noi, 275 feet high, just eastward of it. Hin Kadai, 75 feet high, lies south of the latter, and Koh Mu, 271 feet high, about a mile to the eastward. There is a channel into Sheltered bay between these islands and Koh Pra, and

*General chart 2414.*

*Plan of Koh Pra anchorages on 3727. Var. about 2° E.*

Koh Satahipjai northward of them, and there is a channel to it also between Koh Pra and Lem Putau.

**COAST.**—**Tung Kitea bay** lies close northward of Lem Putau. Fresh water can be obtained in the south-east corner of this bay, but in other respects it is an undesirable anchorage.

*Chart 2720, Koh Ta Kut to Cape Liant.*

**KOH KRAM** is 3 miles in length, north and south, 2 miles in breadth, and 704 feet in height near its south end; its western coast is fairly steep-to, but a reef extends half a mile from the eastern side, with an isolated patch beyond; on the east side of the south extreme a reef projects nearly half a mile.

*Plan of Koh Kram bay on 2720.*

**The bay** on the north-west side of Koh Kram is half a mile wide at its entrance with a depth of about 5 fathoms, and there is about 3 fathoms at half a mile from its head; it might afford temporary anchorage. There is a strong stream or current over the foul ground off West point, but it is scarcely perceptible in the bay.

*Chart 2720, Koh Ta Kut to Cape Liant.*

**The channel** between Koh Kram and the mainland is nearly 2 miles wide with a fairway depth of from 6 to 10 fathoms. The best channel is apparently eastward of Koh Ira, keeping close to the mainland. The channel westward of Koh Ira and then eastward of Sombrero appears safe also.

Koh Ira lies in the fairway of the southern entrance of this channel; its south and east sides are fringed by a reef with an islet or rock beyond; at 2 cables north-eastward of this island, there is a rocky reef.

Sombrero rock or Hin Luk Kai, lies three-quarters of a mile from the south-east side of Koh Kram (the chart shows another island or rock westward of it). A sunken rock is charted three-quarters of a mile off the east side of Koh Kram, and one mile northward of Sombrero.

**Tung Plong bay**, on the mainland, being sheltered by Koh Kram and Koh Ira, offers secure anchorage for small craft.

**Islets.**—At 16 miles north-north-west of Koh Kram is Koh Luem; between these is a chain of islets, namely, Koh Rin, 360 feet in height; Kring Badung, 194 feet; Mana Mechi, 154 feet; and the larger island, Koh Pai, 511 feet in height and 2 miles in length. There are several rocks around Koh Rin, all above water; the highest are White rock, 50 feet, and Tree rock, 51 feet, each with a little brushwood on them.

**KOH LUEM, or Pilot island** (*Lat. 12° 57½' N., Long. 100° 38' E.*), the northernmost of these islets, is three-quarters of a mile in length, half a mile in breadth, steep-to on the south and west sides, and rises from the sea bold and cliffy; its peak is of a dome-like appearance, and 445 feet in height.

A reef with 2 to 4 fathoms, and 8 to 13 fathoms close-to, extends at least 2 miles in a northerly direction from Koh Luem. A patch of 3½ fathoms lies 1½ miles eastward of the north extreme of the island.

*General chart 2414.*

*Chart 2720, Koh Ta Kut to Cape Liant. Var. about 2° E.*

This island, from its conspicuous and peculiar position, has long been considered the principal landmark at the head of the gulf; before the establishment of the light on Koh Chuen, vessels bound to Bangkok river made it, took their departure from it, and ran boldly for the anchorage off the bar by day or night.

**KOH LĀN**, lying between Koh Pai and the shore, is  $2\frac{1}{2}$  miles in length, one mile in breadth, and 635 feet in height. On its eastern side is a village; plantains and pine-apples are plentiful, and a few fish are obtainable. A small island, named North Lān, lies half a mile from its north end, and East Lān, a mile from its north-east side.

**Rocks. — Buoys.** — At one mile south of the summit of East Lān lies Phra nang rock with a depth of  $2\frac{1}{2}$  fathoms, with a black and white conical buoy at its north extreme.

East Lān rock, about a cable in extent, with 3 feet water, at one mile  $103^\circ$  true of East Lān, is marked by a red buoy.

**Anchorage.**—There is good anchorage in the south-west monsoon close under the north-east side of Koh Lān.

**The COAST** between Tung Plong bay and Koh Klet keo, 4 miles to the northward, is composed of high rocky bluffs, with sandy bays between. At  $3\frac{1}{4}$  miles north-westward of Klet keo is Cliff rock, 40 feet high, with a few trees on its summit.

**Lem Patáya** (*Lat.  $12^\circ 55' N.$ , Long.  $100^\circ 50' E.$* ), 9 miles northward of Klet keo, presents a number of low rocky bluffs to seaward, having at a short distance within, a hill 370 feet high. Between Klet keo and Lem Patáya is a deep bay with low land around it.

**Patches.**—A patch of  $2\frac{3}{4}$  fathoms lies  $13^\circ$  true  $3\frac{1}{4}$  miles from Klet keo, and one of  $2\frac{1}{2}$  fathoms, and about a mile in length  $204^\circ$  true 3 miles from the hill on Lem Patáya; there are patches of  $4\frac{1}{2}$  and  $4\frac{3}{4}$  fathoms between these, and others may exist.

Between Lem Patáya and Lem Kra bang, 9 miles northward, is a bay from the head of which the shore bank extends  $1\frac{1}{2}$  miles, with no dangers beyond it. At  $1\frac{1}{4}$  miles northward of Lem Patáya is a low rocky islet one cable in extent, and a bank with  $2\frac{3}{4}$  to 3 fathoms lies between a half and  $1\frac{1}{2}$  miles southward of Lem Kra bang.

**Lem Kwan** is a prominent point in the bay, the coast northward of it being all low.

The village of Ban Sarai is here, and within it is a concession of 10,000 acres belonging to a Japanese company planting cotton and rubber.

**Koh Nak** is an islet situated about  $4\frac{1}{2}$  miles south-westward of Lem Kra bang.

At Lem Kra bang commences a range of hills which borders the coast for 8 miles, and thence extending inland joins the Bang Pla Soi mountains.

*General chart 2414.*

*Chart 2720, Koh Ta Kut to Cape Liant. Var. about 2° E.*

From Lem Kra bang to Bang Pra, the coast consists of a number of rocky points, with shallow sandy bays between.

*Plan 1389, Koh Sichang harbour, and chart 2720.*

**KOH SICHANG.**—At 4 miles west-north-westward of Lem Kra bang is Kangku island (*Lat. 13° 7' N., Long. 100° 47' E.*), about half a mile in extent and 325 feet in height, the southernmost islet of the Sichang group.

Koh Sichang, the largest of the group, is about  $3\frac{1}{2}$  miles in length, north and south, by about one mile in breadth; its summit is 608 feet in height, near the north end. Off the eastern side of this island are the islets of Koh Kam yai, 209 feet, Koh Kam noi 80 feet, Koh Plong 34 feet, and Koh ran Dokmai, 54 feet high, which afford some shelter to the anchorage off Rai Lang and Rai Bon, the northern villages in Sichang.

**Dangers.—Buoys.**—The buoys are not to be relied on.

**Koh Kam yai flat.**—From Koh Kam yai, a flat with less than 3 fathoms, extends half a mile north-westward, with a reef partly dry at low water, 2 cables within its extreme.

A red buoy, in about 3 fathoms, lies nearly one cable north-west of the reef.

The west and south sides of the island are foul to the distance of about a quarter of a mile, and the east and north sides to a less distance.

Reefs surround the three small islets to the distance of about one cable in places, and a similar reef fronts the shore of Sichang to the distance of about  $1\frac{1}{2}$  cables. These will be best seen on the plan.

**A patch**, with a depth of 2 feet, lies off this reef on the edge of the 3-fathoms line, with Lem Tarote (Custom house point) bearing 277° true, distant  $2\frac{1}{2}$  cables.

A red buoy, in about  $3\frac{1}{4}$  fathoms, lies near the eastern edge of the patch.

**Hin Kong nok.**—At about 8 cables northward of the north-east extreme of Sichang is Hin Kong nok, a reef about 70 yards in extent, and awash at low water springs. A black and white chequered buoy is placed off its west side.

**Hin sam mah Yeu** is a rock 10 feet high, and about three-quarters of a cable in length, situated about 6 cables north-north-westward of the north-west point of Sichang.

**Light.**—A *fixed red* light, named Asadang, is exhibited from a white tower 15 feet high, on Hin sam mah Yeu, at an elevation of 25 feet above high water.

**Limits of the port.**—The limits of the port are thus defined:—

**North limit.**—A line drawn 90° true from the north end of Hin Sam mah yeu (10-foot rock).

*General chart 2414.*

*Plan 1389, Koh Sichang harbour and chart 2720. Var. about 2° E.*

**East limit.**—A line drawn 0° true and 180° true from the eastern extreme of Koh ran dokmai.

**South limit.**—A line drawn 90° true from the obelisk on Lem Wat.

**West limit.**—A line joining Hin Sam mah yeu and the north-west point of Koh Sichang.

**Ballast-discharging limit** is shown on the plan eastward of Koh Kam noi and Koh Plong.

**Anchorage.**—There is anchorage for light or moderate draughts in a depth of about 4 fathoms, sand and mud, between the south-west extreme of Koh Kam yai and Lem Tarote; this, though shallow, is known as the Man-of-war anchorage.

Between the north extreme of Koh Kam yai and Sichang is the inner anchorage, with depths of about 3 fathoms.

The outer anchorage, in about  $4\frac{1}{2}$  fathoms, is situated about one mile northward of Koh Kam yai, with deeper water farther north-eastward.

The plan affords a sufficient guide to any of these anchorages, either from northward or southward.

**Completing loading.**—Ocean steamers complete their loading here after leaving Bangkok, in the south-west monsoon period; from November to early in February they do so off Ang Hin, to which place the Customs authorities move.

There are from 200 to 300 inhabitants in Koh Sichang.

**Tides.**—It is high water, full and change, at Koh Sichang, at 6h. 30m. approximate; springs rise from  $9\frac{1}{4}$  to  $11\frac{1}{4}$  feet, neaps from  $6\frac{1}{2}$  to 8 feet.

**Supplies.**—Bread, beef, and vegetables may be obtained if sufficient notice is given to get them from Bangkok. Water is obtainable only through the courtesy of the naval authorities at Bangkok, but it is not fit to drink. Coal is sent down from Bangkok when ordered. A little fruit and a few eggs are obtainable. *See supplies at Bangkok, re water, page 179.*

**Telegraph.**—A submarine cable from the west side of Koh Kam Yai connects with the mainland, enabling shipping at Koh Sichang to communicate with Bangkok. There is a flagstaff on the summit of the island.

**Pratique** is given here if from a non-infected port, *see page 164.*

**Landing.**—There is a landing pier named the Royal pier, at Lem Wat, and another, not so good, close to the hotel within Lem Tarote.

**The channel** between the Koh Sichang dangers and the mainland is about  $3\frac{1}{2}$  miles wide, with depths of 10 to 13 fathoms in the fairway, decreasing gradually towards the main; it is apparently free from danger.

*General chart 2414.*

*Chart 2720, Koh Ta Kut to Cape Liant.*

**COAST.**—Koh Si Maha racha (Koh Loi) (*Lat.*  $13^{\circ} 10\frac{1}{2}'$  *N.*, *Long.*  $100^{\circ} 54'$  *E.*) is a rocky islet about 90 feet high, lying about a third of a mile from the coast, and  $6\frac{1}{2}$  miles eastward from the north point of Koh Sichang.

**Towns.**—The town of Si Maha racha (Sriracha) stands on the mainland about half a mile south-east from the islet, and contains about 500 inhabitants; the town of Bang Pra, on the coast, about 3 miles to the northward, has about 1,000 inhabitants.

**Pier.**—There is a pier, from which timber is shipped, reported to be half a mile in length, extending beyond the islet.

**Patch.**—There is a patch of one fathom one mile off Bang Pra, just within the 3-fathoms contour, and a patch of  $4\frac{3}{4}$  fathoms outside the 5-fathoms contour.

**Anchorage.**—There is anchorage for small craft in 3 fathoms, with Koh si Maha racha (Loi) bearing  $81^{\circ}$  true, distant half a mile, with deeper water farther off.

**Supplies.**—Fresh water is abundant, but not very good; the towns of Si Maha racha (Sriracha) and Bang Pra can furnish quantities of fresh stock. There is a good market at the former place. Game is plentiful. At the distances of half and three-quarters of a mile southward of Bang Pra, are two fine streams of water that discharge over the beach, and the natives say that they never dry. A boat might fill from these streams at high water, but at low tide the sands dry out so far that they could not be approached within half a mile.

The soil in this neighbourhood is fertile, and the vicinity of the Bang Pla Soi hills, rising to the height of 2,300 feet, would afford a retreat from the summer heat, and render this spot an admirable position for a European settlement.

**Telegraph.**—There is a post office and telegraph station at these places. At Bang Pra is a naval college, and at Sriracha there is a naval hospital.

**Lem Sah Muk**, or Double head, a prominent bluff rising from the low land to the height of 249 feet, and appearing at a distance like an island, lies 8 miles northward of Koh Si Maha racha; the coast between is fronted by a shallow bank to the distance of  $1\frac{1}{2}$  miles in places, but reduced to half a mile at Lem Sah Muk.

Mount Bang Pla Soi Yai lies 8 miles within Lem Sah Muk, and is 2,497 feet in height.

**ANG HIN.**—**Anchorage.**—Ang Hin village lies 2 miles north-eastward of Lem Sah Muk. Off it there is anchorage in about 3 fathoms at one mile distance, and deeper water farther off. Ocean-going vessels from Bangkok complete their loading here during the strength of the north-east monsoon.

It is also a pratique station, but *see* page 164.

**Limits of anchorage.**—The western limit of the anchorage of Ang Hin is defined to be the 7-fathoms contour line, and the  
*General chart 2414.*

*Chart 2720, Koh Ta Kut to Cape Liant. Var. about 2° E.*

southern limit a line drawn west from Lem Sah Muk; then to the 7-fathoms contour line.

**Customs.**—Ocean-going vessels complete their loading off Ang Hin from November to early February, the Customs authorities moving here from Koh Sichang for that period.

**Bang Pla Soi.**—At 4 miles east-north-eastward of Ang Hin, at the head of a shallow mud bight, is the large town of Bang Pla Soi, a place of considerable importance. The town has a good market, but unfortunately it is only accessible from the sea at high water, in consequence of the mud-flat, which dries off  $1\frac{1}{2}$  miles. Immediately at the back of the town there is a small range of hills from 400 to 450 feet in height, which is the termination of the high land northward on this side of the gulf.

**Pier.**—There is a landing pier abreast the town available only at near high water.

**Light** (*Lat. 13° 22' N., Long. 100° 58' E.*).—At Bang Pla Soi a *fixed white* light, at an elevation of 33 feet above high water, is occasionally exhibited, said to be visible in clear weather from a distance of 10 miles.

*Plan of Bang pak kong river on 2720.*

**BANG PAK KONG RIVER** empties itself into the gulf at 5 miles northward of Bang Pla Soi, and is said to be navigable for small craft as far as Prachin, a distance of 104 miles from the entrance. A mud flat, with depths of less than 6 feet, and covered with fishing stakes, front the mouth of the river to the distance of 5 miles.

There is a depth of about 2 feet on the bar at low water springs.

**Beacons.**—The channel is marked by red beacons on the west, and white beacons on the east side. Fairway beacon stands in 6 feet of water at the entrance of the channel; it is a pole with red ball 18 feet above high water.

**Tides.**—It is high water, full and change, at Bang pak kong entrance, at 7h.; springs rise  $9\frac{3}{4}$  feet, but *see* tides, Bangkok, page 173.

Petriu is a small port on this river, situated in a very fertile rice district; it has several rice mills, and is the terminus of the eastern line of the State railways.

*Chart 999, Bangkok river.*

**MENAM CHAU FYA or BANGKOK RIVER** rises in the mountains of Yun nan, is about 300 miles in length, and navigable for small craft for about 60 miles. The city of Bangkok is situated about 25 miles from its mouth, and is accessible to all vessels that can cross the bar. It has many tributaries.

**The bar.—Depths.**—The river is about one mile wide between its entrance points, with a depth of  $1\frac{3}{4}$  fathoms at low-water springs. The west side of the entrance is fronted by a mud bank, which dries off to a distance of  $1\frac{1}{2}$  miles, and the east side by one which dries to the distance of a third of a mile.

*General charts 2720, 2414.*

Chart 999, Bangkok river. Var. about 2° E.

The bar is a shifting one subject to frequent changes, and stretches seaward for a distance of more than 6 miles from the entrance points; when at its lowest level, which is about the month of April, it has sometimes not more than 3 feet at low water. The depth at the highest tide over the bar at this time of year will be about 12 feet, and in the month of October, when the depth is the greatest, about 15 feet. The depth is also affected by the wind, southerly winds increasing the height of the water on the bar. (See tidal signals made from the lighthouse, page 172, and remarks on tides, pages 173-175).

Vessels can be forced through the mud, which is very soft. Extensive banks of mud and sand dry at low water on the bar, and it is covered with fishing stakes, which extend out  $2\frac{1}{2}$  miles or more southward of the bar lighthouse. Tracks are shown eastward and westward of the lighthouse, the better of the two can only be ascertained on the spot; in 1910, that to the eastward, known as the Middle track, was apparently the one recommended. An approximate eastern track is also charted, used by coasting craft.

Junks laden with stones were many years ago sunk at intervals across the mouth of the river abreast West point; these, known as East, Mid, and West Junk, have become a solid mass by the accumulation of sand and mud, with a depth of about 5 feet at low water over them. Others were sunk in 1893 in the same part of the channel; the only available passage is between East and Mid Junk.

**LIGHTS.—Regent or Bar lighthouse.**—From a screw-pile lighthouse, painted red, on the bar of Bangkok river, situated about  $4\frac{1}{2}$  miles  $178^{\circ}$  true of the landing at West point, an *occulting white* light is exhibited *every twenty seconds* at an elevation of 44 feet above high water, visible in clear weather from a distance of 10 miles. The light shows for *fifteen seconds*, and is eclipsed *five seconds*.

The building, known as the Regent or Bar lighthouse, is charted in lat.  $13^{\circ} 28' N.$ , long.  $100^{\circ} 34' E.$ , position approximate. It is connected with the mainland by a telegraph cable.

**Outer bar.**—A light-vessel, painted red with white bulwarks, exhibiting a *red fixed* light, at an elevation of 40 feet above the sea, visible from a distance of 6 miles, is situated at a distance of  $1\frac{1}{2}$  miles  $151^{\circ}$  true from the Bar lighthouse.

**Inner bar.**—A light-vessel, painted green with white bulwarks, exhibiting a *green fixed* light, at an elevation of 40 feet above the sea, visible from a distance of 6 miles, is situated at a distance of 3 miles,  $38^{\circ}$  true from the Bar lighthouse.

A light-vessel, painted red with a red ball at the masthead, exhibiting a *fixed red* light, visible about 5 miles, is moored head and stern abreast West point over Mid Junk shoal.

**Buoys and beacons.**—A black buoy, surmounted by a ball, is moored at the entrance of the Western channel near the outer edge of the bar, in a position  $235^{\circ}$  true  $2\frac{1}{2}$  miles from the Bar lighthouse. A black beacon, surmounted with staff and globe, is placed on the edge

General charts 2720, 2414.



*Chart 999, Bangkok river. Var. about 2° E.*

of the bank, known as Mud point, and lies 13° true, about  $2\frac{8}{10}$  miles from the Bar lighthouse. White beacons are charted 109° true, 8 cables, and 103° true,  $2\frac{1}{10}$  miles, from Inner bar light-vessel, marking south side of the Eastern track. A green buoy marks East Junk rock.

**Caution.**—Owing to frequent changes in the depths, the positions of the beacons and buoys are constantly being altered. Vessels should not attempt to cross the bar without local assistance or personal examination of the channel. *See* Tidal signals below.

**Pilots.**—There is a hulk for the pilots anchored outside the bar, in a depth of  $3\frac{1}{2}$  fathoms, about  $2\frac{1}{2}$  miles south-south-eastward from the lighthouse. There are four European pilots, but it is stated that at times they are all at Bangkok. The vessel has one mast, is painted white, carries a *bright white* light at night, and shows a flare-up at short intervals. The pilot flag is red and white horizontal, and the pilot limit is the 4-fathoms contour line off the entrance.

**Pilotage tariff.**—The rates cover pilotage from outside the Bar to Bangkok, and from Bangkok to a safe anchorage outside the bar. Rates for all tonnage will be found in the Laws on Navigation, pages 547-558, which all vessels are required to purchase. The pilotage charge for a steam vessel, or a sailing vessel being towed, of 500 tons, is \$117, with a proportionate charge for less or greater draughts. The charge for 1,000 tons is \$136.50. One dollar extra for every 50 tons additional. For full details, *see* the Laws above quoted.

**Bar anchorages.**—During the south-west monsoon the anchorage recommended off the bar is in  $4\frac{1}{2}$  fathoms, with the Bar lighthouse bearing about 19° true, distant  $3\frac{1}{2}$  miles; the anchorage during the north-east monsoon is about 4 miles farther eastward in 5 fathoms, with Bar lighthouse bearing 311° true, distant  $4\frac{1}{2}$  miles.

**Limits.**—The limits of the anchorage off the bar are thus defined:

**West limit.**—A line drawn 180° true from an obelisk, erected about midway between the entrance to Bangkok river and that of Tachin river, to the 7-fathom contour line.—**South limit.**—The 7-fathom contour line.—**East limit.**—The anchorage off Ang Hin.

**Wreck.**—At the distance of  $4\frac{1}{2}$  miles, 147° true, from the station of the pilot schooner lies the wreck of a three-masted junk, with one mast above water, temporarily marked by a pole with two flags. (Notice to Mariners 1,468, 1912.)

**Tidal signals.**—Upon flag L, Commercial Code, being hoisted by a vessel asking for the depth of water on the bar, the following signals, in the same code, are made from the lighthouse:—

Flag	Feet or Inches	Flag	Feet or Inches	Flag	Feet or Inches	Flag	Feet or Inches
S	1	B	5	M	9	N	13
J	2	C	6	Siamese flag.	10	V	14
H	3	R	7	T	11	—	—
K	4	P	8	W	12	—	—

*Chart 999, Bangkok river. Var. about 2° E.*

The upper flag indicates the number of feet; the lower flag the number of inches.

**Directions.**—The west point of entrance to Bangkok river has a clump of trees, the tops of which are about 30 feet above the surrounding mangroves. Southward of the trees is a fort visible at the distance of about 7 miles. The trees will usually be the first object seen from the offing; in hazy weather the Bar lighthouse or the pilot hulk outside the bar will be the only marks visible.

Approaching Bangkok river, West point should be brought to bear about 351° true, and steered for on that bearing will lead in the direction of the Bar lighthouse, and to the pilot hulk, from which a pilot should be obtained. The lighthouse keeper will signal the depth of water on the bar in answer to letter L of the Commercial Code (*see* page 172). The bar should be crossed with a good head of steam, and the boiler feeds kept closed as much as possible. The flood stream sets to the westward or across the bar channel. (*See Tides below.*)

The best channel in 1910 was the Middle track, passing a little eastward of the Outer bar light-vessel, nearly direct for the Inner bar light-vessel, and passing westward of it, from whence the fairway lies between East Junk buoy and the light-vessel on Mid-Junk; thence keeping towards the bends of the river in proceeding up to the City; *plan 3592. See Siam navigation laws, pages 547-558.*

**Caution.**—Approaching the bar of Bangkok river from the southward, in the north-east monsoon, it will be necessary when near the head of the gulf to allow for a westerly current which occasionally runs with considerable strength along the edge of the bank; sailing vessels set to leeward by it have found difficulty in gaining the anchorage.

**Tides.\***—It is high water, full and change, at Bangkok river bar at 7h. 40m., but this is subject to a large correction, the greater part of which varies with the moon's declination, the result being that the time of high water at new and full moon fluctuates between after 5h. and before 10h.

Springs rise (higher tide) 11 feet, neaps (higher tide) 9 feet, the tides being usually higher in winter than in summer, but the extreme annual difference between the highest and lowest spring higher high waters does not appear to be more than one foot.

There is a large diurnal inequality of both time and height. The a.m. tides are the higher from October to March, or with the sun's declination south, and the p.m. tides the higher from April to Sep-

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\* Analysis of four years' observations of times and heights of high water at Bangkok river bar taken from tides recorded in Navigating Officer's Remark Book, H.M.S. *Swift*, 1894.

Abstract diagrams for years 1884 and 1887 plotted in Hydrographic Office, Admiralty.

*General charts 2720, 2414.*

*Chart 999, Bangkok river. Var. about 2° E.*

tember. There are usually two tides in the day, but when the moon's transit is between 2h. and 5h. the inferior tide often disappears, the result then being that there is only one tide at that period, the a.m. high water between October and March, and the p.m. high water between April and September.

The springs, or highest semi-menstrual tides, do not happen at new or full moon, but appear to occur, according to the time of year, with the moon in certain declinational positions, as follows:—

- January and July - - Preceding or at the maximum N. or S. declination.  
 February and August - Following the maximum N. or S. declination.  
 March and September - Before moon reaches the equator, uncertain in these months.  
 April and October - - With the moon near the equator.  
 May and November - - After moon leaves the equator.  
 June and December - Preceding the maximum N. or S. declination.

#### Mean lunital intervals.

Hours of Moon's transit.											
0	1	2	3	4	5	6	7	8	9	10	11
h. m. 7 40	h. m. 7 25	h. m. 7 20	h. m. 7 45	h. m. 8 30	h. m. 9 0	h. m. 9 10	h. m. 9 5	h. m. 8 55	h. m. 8 40	h. m. 8 20	h. m. 8 5

#### Correction to high-water times for moon's declination.

(Going north.)				North.		Moon's Declination. (Going south.)				South.		(Going north.)			
0	7°	14°	21°	28°	21°	14°	7°	0	7°	14°	21°	28°	21°	14°	7°

#### Correction to time of tide following moon's superior transit.

m. 60+	m. 90+	m. 125+	m. 135+	m. 100+	m. 45+	m. 5-	m. 45-	m. 85-	m. 120-	m. 140-	m. 125-	m. 90-	m. 55-	m. 15-	m. 20+
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#### Correction to time of tide following moon's inferior transit.

m. 110-	m. 125-	m. 100-	m. 75-	m. 40-	m. 10-	m. 20+	m. 55+	m. 80+	m. 105+	m. 125+	m. 105+	m. 60+	m. 20+	m. 20-	m. 75-
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*General charts 2720, 2414.*

*Chart 999, Bangkok river. Var. about 2° E.*

**To find approximately the time of high water.**—To the time of moon's transit, add lunitidal interval for that transit, and take out moon's declination for resulting time, to which last apply the correction for the moon's declination as given above, distinguishing between the tides following the moon's superior and inferior transits. The result will be approximately the time of high water.

**NOTE.**—If the maximum declination is less than 28°, then the correction for declination at its maximum is the mean of that under the two declinations of that amount, on either side of 28°. For example, if 21° N. be the maximum declination, then the time correction at that maximum is the mean of 135m. + and 45m. + = 90m. +.

**Tidal streams.**—Outside the bar and near the anchorage the flood sets to the westward, and the ebb to the eastward, altering its direction according to the strength of the river stream. Along the eastern shore of the gulf, towards Cape Liant, the ebb sets to the southward, and flood to the northward.

**At Bangkok** the time of high water is about 3 hours later than at the bar. The range of tide in April is from 8 to 9 feet; towards the end of the rainy season (the beginning of October) when the river is much swollen, with its banks frequently flooded and the country inundated, the range at springs is only about 4 feet.

Owing to freshets, vessels rarely swing to the flood off Bangkok during the months of September to December, inclusive.

**Weather.**—At the bar anchorage, in the south-west monsoon season, the wind is from S.W., to S. by E., seldom being westward of S.W. never blowing very hard, but occasionally a puff from the N.W. There is a choppy sea at times, rendering the hoisting up of boats somewhat risky. It is pretty safe to prepare for rain (July) at this season in the evening. Clouds generally gather between 4 and 5 p.m., often setting to windward, and the rain, preceded by a puff of wind, comes down in torrents, accompanied by lightning and thunder. In January, the north-east monsoon period, the wind was as frequently from S.W. as from N.E., light with occasional calms and fine weather. (See Winds and Weather, page 179, and table on page 562.)

*Chart 999, Bangkok harbour.*

**Above the bar.**—**Paknam** (*Lat. 13°36' N., Long. 100°34' E.*).—At about 3 miles within the entrance, on the eastern bank, is Paknam, where vessels arriving have to stop to take on board a Custom house officer. Here is a fair market, from which vessels remaining at the bar anchorage can obtain their daily supplies of fresh food. Opposite Paknam are two islets; on the southern one is a fort. A telegraph cable connects Paknam with the southern islet; it is marked at each end by a post and white disc; vessels are prohibited from anchoring within half a cable of it.

*General charts 2720, 2414.*

*Chart 999, Bangkok river.*

Paknam is connected with Bangkok by railway and telegraph, and has a population of 6,000 to 7,000.

**Canal.—Paklat Lang**, on the western bank of the river, 5 miles above Paknam, is situated at the entrance to a canal which saves a circuit of nearly 10 miles to boats proceeding to or from Bangkok; vessels must take the circuitous route by the river. The entrance is marked by a guardhouse on each side, and its vicinity may be known by its church and a long range of unarmed batteries half a mile above on the same side of the river. The canal re-enters the river alongside some floating houses at the small village of Paklat Bon, near Upper Paklat.

This canal is closed during the rains in order to avoid injury by the freshets.

Paklat Lang has a population of about 7,000.

**Aspect of river.**—Above Paklat Lang, is seen successively upon the eastern bank, the first group of petroleum reservoirs, with a wharf and a cleared space, on a portion of which is Bang Chak railway station. Some distance above is a second group of petroleum reservoirs, and  $1\frac{1}{2}$  miles beyond, on the western bank, the chimneys of the rice and sawmills are conspicuous. Fine trees line the river banks, &c., in the lower portion of the river.

*Plan 3592, Bangkok harbour; also 999.*

**BANGKOK** (*Lat.  $13^{\circ} 45' N.$ , Long.  $100^{\circ} 28' E.$* ), the capital and seat of commerce of the kingdom of Siam, is 25 miles above the entrance points following the river course, or about 14 miles direct. The west bank is chiefly occupied by Siamese, Chinese, and Mahomedan residents. The bulk of the business is transacted on the east side.

On the east bank of the river is the city proper, occupying a space about 3 miles in length by the same in breadth, traversed by canals, and surrounded by battlements flanked by towers in places. Here are the Royal palaces, the foreign warehouses, the consulates, the principal rice mills, and most of the public offices. A road known as the Charum Krung extends from the palace walls to Bangkolem, and the electric railway runs along it and other roads for a distance of about 11 miles. The principal buildings include the Anglican church, a Roman Catholic cathedral, several missionary chapels, two hospitals, &c. The King's palace and the temples are magnificent and on a large scale, the architecture being of a kind peculiar to the country. Tramways were introduced in 1888, and the principal streets and houses are lighted by electricity. A considerable portion of the river banks above the city are lined with floating houses, over which can be seen thick clusters of wooden houses built on piles.

*General charts 2720, 2414.*

*Plan 3592, Bangkok harbour; also 999. Var. about 1° 30' E.*

**Population.**—The city of Bangkok, according to the census of 1909, has a population of 628,675 inhabitants. The number of British subjects is about 10,000 in the Consular district.

**Trade.**—The principal exports are rice, teak, pepper, fish, sapan wood, and bullocks; the imports are treasure, gold leaf, cotton goods, cotton yarn, opium, silks,, gunny bags, kerosene, hardware, &c.

The aggregate value of exports for the year ending April, 1910, was £7,755,798, and the imports £5,278,768. The export of rice amounted to nearly 900,000 tons. *See also page 8.*

Rice is produced in immense quantities, not only from the innumerable fields which line the fertile valley of the Menam, but from the adjacent rivers which flow into the gulf from the enormous watershed of the mountain crescent which fringes the northern extremity of the kingdom. The principal industries are rice milling, teak saw milling, ship and boat building and engineering. Ayuthea (plan on 999), and Paknampoh are centres of big rice districts on the Menam.

Paknampoh is situated at the junction of the Menam with the Me Ping and Me Nan.

Korat, the north-eastern terminus of the State railways, is the centre of a large agricultural and forest district, and is on the trade route to Ubon, on the Mekong.

There are 26 steam rice mills in Bangkok.

Chiangmai, one of the most important trading centres, is situated on the Me Ping branch of the river, in about lat. 18° 50' N., long. 99° 55' E. It does a considerable trade with Moulmein as well as with Bangkok; the principal exports are teak, silver, and cattle. The railway from Bangkok is within 100 miles of it, 1911. About 1,000 boats were engaged in the river traffic to Bangkok in 1908. Its rainfall in 1908 amounted to 68·63 inches; average 54·83 inches. Population in 1909 numbered 50,000.

**Shipping.**—The number of vessels engaged in foreign trade that entered the port of Bangkok in 1909 was 804, with an aggregate tonnage of 754,103 tons. 811 vessels cleared. Only 2 sailing vessels entered of the aggregate tonnage of 1,970 tons, also about 150 junks. Vessels above 12 or 13 feet draught complete their cargoes at Koh Si Chang in the south-west monsoon, and at Ang Hin in the north-east monsoon, each about 20 miles south-eastward of the bar.

**Limits of harbour.**—The limits of the harbour of Bangkok are defined as follows:—

**North limit.**—From the obelisk above the mouth of Klong Bang Krabu in a straight line in a north-westerly direction to the opposite bank of the river, or about 3 miles above the Palace.

**South limit.**—From the obelisk above the mouth of Klong Bang Lampu Lang in a straight line in a north-easterly direction to an

*General charts 2720, 2414.*

*Plan 3592, Bangkok harbour; also 999. Var. about 1° 30' E.*

obelisk on the opposite bank of the river, or about 6 miles below the Palace.

**Anchorage.**—The widest and best place to anchor is  $1\frac{1}{2}$  miles below the British Legation, in about  $5\frac{1}{2}$  to 6 fathoms, as above this the river is much encumbered with shipping and lighters. All vessels are obliged to moor unless made fast to a wharf or landing place. H.M. vessels usually moor off the British Legation. A quantity of floating matter is brought down by the freshets in the rainy season, and the currents run from 4 to 5 knots at times.

Vessels are not allowed to proceed above Klong Tapanhan, just below the Russian Legation, without special permission.

**Prohibited anchorages.**—Vessels are prohibited from anchoring near the line of the telephone cable across the river abreast the Russian Legation. The position is marked by signboards (with an arrow pointing in the direction of the cable) on both sides of the river. Behind these boards are posts with white discs; the post and board in line indicate the direction of the cable.

At night the signboards are lit up by electric light.

There are similar marks for the cable across the river above the Royal Palace, at about one cable below the entrance of the Klong Bangkok noi, on the opposite shore.

There is a cable from Paknam to the island fort abreast, and probably others, which will be known to the pilots. For full details, *see* the Law on Navigation, Appendix I., pages 555-556.

**Mails.**—Communication is maintained with Singapore and Hong Kong by several lines of steam-vessels; the North German Lloyd Company's steamers maintain a regular communication with Hong Kong and other south China ports; a Siamese company, known as the Chino-Siam Steam Navigation Company, was formed in 1909, visiting nearly the same ports; there is also a Danish-Asiatic Company, trading between Bangkok and Europe. Other lines call here.

**Telegraph.**—Bangkok is in telegraphic communication (office always open) with Singapore and the rest of the world. It is also connected with Korat, Nong-Khai, Sesopone, Chentabun, Bangtaphan, Chiangmai, and Mehongson, with Moulmein, and Tavoy in Lower Burma; and with Saigon in Annam; also with Penang. *See* also page 9.

Koh Si Chang is connected by a submarine cable to the mainland, thence by land lines to Bangkok.

**Railway.**—A railway runs from Bangkok north-eastward to Korat, 165 miles, and is being continually extended in that direction. The northern line, through Phitsanulok and Ban Dara has been completed to Sala Ma Puak, 438 kilometers from Bangkok. For others, *see* page 8.

*General charts 2720, 2414.*

*Plan 3592, Bangkok harbour, also chart 999. Var. about 1° 30' E.*

**Supplies.—Coal.**—About 24,000 tons are imported annually, and some 4,000 tons are usually in stock. Steamers are coaled in mid-stream from cargo boats, or at the jetty, about 360 feet in length, where there is usually about 16 feet water at low tide. If a steamer is coaled outside the bar, or at Koh Si Chang or Ang Hin, each distant about 20 miles south-eastward from the bar, an additional charge for lighterage is made. Fresh provisions and other supplies are abundant. Water reservoirs are in course of construction.

**Docks.**—There is a Government dock at Bangkok which takes a vessel of 3,000 tons displacement. There is a crane at the dockyard capable of lifting 30 tons, and workshops, &c., for repairs to Government vessels.

No. 1 dock can take a vessel of 1,200 tons. Its entrance is 40 yards from the river, with a spacious jetty, alongside which vessels can be taken at any state of the tide. There are also machine and moulding shops well supplied with the necessary machinery for repairing steamers up to 1,200 tons, and a pair of shears capable of lifting 20 tons.

There is also a smaller dock, No. 2, and also several mud docks. For details, see Appendix II., page 559.

**WINDS AND WEATHER.**—At Bangkok, early in October, northerly breezes set in, varying towards west and east, and during this month, or early in November, the north-east monsoon is established. Throughout December it continues strong, but in January it has lost half its force, and in February retains only one-fifth of its original strength, the deficiency being partly made up by winds from S.S.E. to S.W. By the end of this month, or early in March, the northerly winds have ceased, and strong breezes from South and S.S.W. prevail.

During the months of May, June, July, and August, south-westerly winds are strong, constant, and sometimes boisterous, the direction being chiefly South to S.S.W. until June, and thence S.W. until September, when light variable winds are the rule and foretell a breaking-up of the south-west monsoon.

Mean temperature for 1909 was 82°·3; total rainfall, 61·81 inches. In 1908 it was 71·36; previous highest recorded, in 1860, was 72·53 inches. The average for 21 years is 54·46 inches. See Meteorological table, page 562.

**Climate.**—Cholera, of which there is usually a small outbreak in March, April, and May, and dysentery are prevalent, and the use of the river water for drinking purposes should be avoided. There is a general hospital at Bangkok to which sailors are admitted.

**Quarantine station.**—See page 164; also Regulations, 556.

*General charts 2720, 2414.*



*Charts, Gulf of Siam, 2414; and 2660a. Var. about 1° 30' E.*

**ROUTES between Saigon and Bangkok.**—From Saigon the recommended route is to pass within Pulo Condore and the Brothers at all times of the year, and to give a wide berth to Pulo Obi and the shallows off Cambodia point.

**South-west monsoon.**—From off Cambodia point, the route is westward of all the real and reported dangers in the fairway of the Gulf of Siam until in lat. about 10° 40' N.; a certain amount of shelter is afforded by bearing towards the Malay side of the gulf. From westward of Koik bank a course may be steered direct for Koh Leum, passing within sight of Koh Chuen light, thence direct to Bangkok bar.

**North-east monsoon.**—From off Cambodia point steer north-westward between the Panjang group and the islands southward of Koh Tron, thence passing a few miles westward of Koh Rong and Koh Samit. From thence a vessel may proceed westward of Kusrovie rocks, shaping course to pass westward of the reported Victory shoal for Koh Chuen light, or may proceed northward along the coast, westward of Koh Kut and Koh Chang, and thence northward of Fasana and Victory shoals, or southward of those dangers for Koh Chuen light, rounding it and proceeding northward to Koh Luen and thence to Bangkok, as before; the whole route is in comparatively smooth water.

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## CHAPTER V.

## FRENCH INDO CHINA.

COASTS OF COCHIN-CHINA AND ANNAM.—CAMBODIA (KAMÁO)  
POINT TO HUÉ RIVER.

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Variation nearly stationary.

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*Chart 2414, Gulf of Siam. Var. about 2° E.*

**General remarks.**—For the regulations regarding vessels approaching or visiting French ports, *see* page 10.

**LOWER COCHIN-CHINA.—Inland navigation.**—We have not here entered into a description of the numerous rivers and streams which in every direction intersect the interior of Lower Cochin-China, most of which lead into the Mekong, which river discharges by the many mouths forming its delta into the China sea; such would be out of place in this work. Some of them are quite deep enough for the passage of small gun-boats, and all, or nearly all, are navigable for the native craft by which the commerce of the country is carried on; the following are the most important:—

The Vaiko, eastern branch, which runs from the north to the south, westward of and parallel to the Saigon arm of the Don nai, is deep, and easily navigated.

The Vaiko, western branch, which runs parallel to the lower part of the Mekong river, and joins the Vaiko, eastern branch, the latter joins the Soirap mouth of Saigon river.

The great commercial canal which unites Mitho to the western branch of the Vaiko river and to Saigon, and also to the numerous affluents of the Don nai. The commercial canal which connects Mekong river with Lower Cochin-China and the Don nai. The canal d'Avalanche, which is immediately northward of Saigon. The Rach mongom, the Rach tach bai, and the Rach babu, which streams afford easy means of communication between Saigon and Baria; and the Don kiang, the Tai kiang, &c., which connect Saigon with Bien Hoa, &c.

Most of the trade passes through the numerous waterways to Saigon; the *Messageries Fluviales Co.* and others afford rapid transit. *See also* the following pages on the Mekong.

**The coast** of Lower Cochin-China, from Cambodia or Kamáo point, its south-western extreme, past the western mouths of the

*General charts 2660a, 1263.*

*Chart 2414, Gulf of Siam. Var. about 2° E.*

Mekong to the Don nai or Saigon river, is low land, inundated by the sea at times, and in most parts the tops of the trees are only just visible at the distance of 11 or 12 miles. The whole coast is fronted with shallow banks of sand, which project 10 or 12 miles in places, having from one to 3 fathoms on them, and 6 to 10 fathoms near their edges. The depths are regular in the offing, decreasing gradually towards these banks, over a bottom mostly of fine sand and ooze.

As this coast is very low and destitute of any particular marks, vessels coming from the westward and going to Cape St. James, ought to be careful to avoid it; after sighting Pulo Obi they should make for the Brothers and Pulo Condore, and from the meridian of this latter group steer a course for Cape St. James. *See Caution, page 183.*

Royalist bank, south-eastward of Pulo Obi, and a 6-fathoms bank, 20 miles east-north-eastward from it, are described on page 136.

**Ganh-hao**, a river situated about midway between Cambodia point and the western entrance of the Mekong, has a low water depth of  $4\frac{1}{2}$  feet on its bar, situated about one mile off-shore, or about 13 feet at high water.

Junks ascend this river to Kamao, the capital of the province, trading here from Hainan, during the south-west monsoon period; and there are waterways leading to the Song ong dok, northward of Cambodia point, into the Gulf of Siam.

Kua bobé, westward of the Ganh-hao, a smaller stream farther westward, also connects with the Gulf of Siam.

There is an old fort at the mouth of the Gang hao, but the entrance is extremely difficult to make out, but the depths decrease gradually towards the shore.

Bak lieu is situated about 4 miles within the coast, about midway between the Gang hao and the western mouth of the Mekong. It is a health resort, and of some importance, and is connected by waterways with Kamao.

#### **DELTA OF THE MEKONG or Cambodia river.—**

The several mouths of the Cambodia river form a delta more than 60 miles in extent, in a north-east and south-west direction. The land is low, and subject to frequent changes in consequence of the accumulation of the alluvial deposit brought down by the different branches of the river. Shallow banks front the whole delta, and extend so far to seaward that the land is in places invisible from their outer edges. The 5-fathoms line of soundings bounding these banks is from 10 to 12 miles off-shore. The depths near its edge decrease suddenly from about 10 to 3 fathoms.

*General charts 2660a, 1263.*

*Chart 2414, Gulf of Siam. Var. about 2° E.*

**Caution.**—Many vessels have gone on shore off this delta, on account of the rapid decrease of the depth and the absence of land-marks. It is therefore necessary in approaching to exercise the greatest caution when navigating westward of the line of Cape St. James bearing 23° true. At the first cast under 11 fathoms, it is necessary to haul out, especially during the north-east monsoon, when the current sets strong south-westward on to the banks, and over which there is then a considerable sea. The direction of the current varies from W.S.W. to S.S.W., and its rate, which depends a great deal upon the force of the wind, is sometimes as much as 40 or 50 miles per day. Near the delta the rate of this current increases with the flood and diminishes with the ebb.

The water from the delta is charged with mud, and discoloured water may at times be seen 7 or 8 miles out at sea towards the end of the ebb.

The mouths of the rivers are only available with local knowledge.

**MEKONG or CAMBODIA RIVER** takes its source in the mountains of Thibet, traverses the Chinese province of Yun nan, the western frontiers of Tong King and Annam, and enters Cambodia between Prea patang and Kratie in about 12° 30' N. A little southward it turns abruptly westward and thence south-westward, where it divides into two branches near Pnom penh or Nam van, the ancient capital of Cambodia, in lat. 11° 36' N., long. 104° 54' E., flowing more or less parallel to one another through Lower Cochin-China, to the China sea.

The western branch is the Ba tak or Hau kiang. It takes from Pnom penh a south-south-east direction, watering the provinces of Angiang, and Vinh Long, of which it forms the western limit. At the city of Angiang or Chaudok, lat. 10° 43' N., long. 105° 5' E., it communicates with the Gulf of Siam at Hatien by the Vinh te, Hatien, or Kankao canal, and with the Tien kiang, the eastern branch, by the Vamnao canal. From Angiang the river follows a south-easterly direction, discharging itself into the China sea by a mouth divided by islands into two channels, namely, the Kua Ba tak, and Kua Din an.

The eastern branch is the Tien kiang. From Pnom penh it makes its way towards the sea parallel to the course of the Hau, and bounds the province of Mitho on the west. At Vinh Long, lat. 10° 17' N., long. 105° 58' E., the Ko khien branch diverges from the main stream southward, and falls into the sea by two mouths. A few miles farther eastward two other branches, the Ham long and the Ba lai, branch off from the main stream; the mouth of the first is named the Ben nhau, that of the second the Ba lai. The main stream flows on past

*General charts 2660a, 1263.*

*Chart 2414, Gulf of Siam. Var. about 2° E.*

the city of Mitho, and finally enters the sea by two mouths, named Kua dai and Kua tieu.

At the splitting of the river into the two branches at Pnom penh, in lat.  $11^{\circ} 36'$  N. above mentioned, it is joined by a branch which trends to the north-westward, and passing Udon, a royal residence, goes to supply a large lake, nearly 60 miles in extent, about 6 or 7 miles north of which, up a small river, are the extensive ruins of the ancient city of Angkor. The waters run into this lake during the south-west monsoon, the rainy season, and discharge into the Mekong in the opposite season.

*Chart 2424, Gulf of Siam, and 2660a.*

**Entrances.**—The principal mouths have from 7 to 10 feet at low water over their bars; springs rise from 10 to 12 feet. Above the bars the depths increase considerably in most of them, but the rivers can only be navigated by those acquainted. The northernmost mouth, the Kua tieu, page 187, is the only one generally used, it leads to Mitho, &c. The ebb stream in the rainy season attains a rate of 3 to 4 knots, and a quantity of floating matter is brought down by it; at other times the velocity is from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  knots at springs, the ebb being stronger than the flood.

**Inland navigation.—Height of river.**—The water in this great river commences to rise in the month of May, attains its maximum in October, whence it decreases until March. The rise is 17 feet at Chaudok, about 100 miles from its mouths, and 26 to 33 feet at Pnom penh, about 70 miles above (*Lat.  $11^{\circ} 36'$  N.*). Tides are only felt during the season when the waters are low, the rise being about one foot at Pnom penh, and nearly  $4\frac{1}{2}$  feet at Chaudok.

At Kratie (near Pasop) (*Lat.  $12^{\circ} 30'$  N., Long.  $106^{\circ} 0'$  E.*), about 100 miles above Pnom penh, or 270 miles from the sea, the water attains a first maximum in August, a second in September, thence falling until April. It is anticipated that with the removal of some obstructions a vessel of 3 feet draught, with a speed of 12 knots, in charge of a competent pilot, may ascend as far as the Strung Streng at low river.

Small craft can reach Pnom penh at all seasons, and during high river, or from July to November, can go up as far as the ancient city of Ang kor.

The Strung Streng, lat.  $13^{\circ} 32'$  N., about 420 miles up, is a large tributary of the Mekong, and much influences the rise of the water in the Mekong. Near, apparently below, are the Prea patang rapids, through which there is reported to be a deep channel.

*General chart 1263.*

*Charts 2414, 2660a.*

Between Paknum and Kemarat (charted in lat.  $16^{\circ} 0' N.$ ), 50 miles apart, the latter about 600 miles up, there are no less than 28 rapids; these rapids are impracticable from January to May at low river, and risky from mid-August to mid-October, high river, when the current is very strong; at other times they are practicable for vessels of about 2 feet draught. The gun-boat *Massie* took six days to do these 50 miles. This vessel, drawing 2 feet, and accompanied by the *Grandière*, both upper Mekong gun-boats, ascended to Vien Tian, about 300 miles above Kemarat (beyond the limits of our charts), and thence to Luang Phrabang (*Lat.  $18^{\circ} N.$* ), 250 miles beyond, and nearly 1,200 miles from the sea, reaching the latter place early in September, in about 14 days from Vien Tian.

The rise of river at Vien Tian is about 40 feet, and at Luang Phrabang 50 feet.

This portion is considered navigable by craft of about 2 feet draught to Keng Luong, 60 miles below Luang Phrabang, for about 3 months, or when the water is 20 feet above low river at Vien Tian, though the navigation is considered dangerous a week or more on either side of high river, as the current is violent. There are numerous rapids in this portion, beginning about 15 miles above Vien Tian. Luang Phrabang has a population of 10 to 12 thousand.

A Consular report states: "The river is open for navigation all the year up to Khone, where at high river it is barred by rapids. The river between Khone and Kong, about lat.  $14^{\circ} N.$ , for an altogether contrary reason, is impracticable during the dry season even for small launches. From Bandong, a village on the upper side of the island of Kong, the river is navigable at all times for steamers of  $2\frac{1}{2}$  feet draught to the northern limit of the province."

There is a light railway across Kong island, 4 miles in length, on which two small steamers were transported to the river above.

**The capital.—Pnom penh** (*Lat.  $11^{\circ} 36' N.$ , Long.  $104^{\circ} 54' E.$* ), the capital of Cambodia and seat of Government, is about 170 miles above the entrance of the Mekong. French functionaries have charge of the treasury, the administration of justice, customs, &c. The capital has been considerably improved under the present rule, roads have been made, sanitary works carried out, and the town lighted by electricity. The new treasury is the most remarkable building. Population about 26,000. The trade passes through Saigon. Easy communication is afforded with the principal towns in the interior by light-draught steamers. A land telegraph wire connects it with Bangkok and Tavoy (Burma).

*General chart 1263.*

*Charts 2414, 2660a. Var. about 2° E.*

**Communication.**—The Messageries Fluviales, in 1910, inaugurated a weekly service on the Mekong to the town of Ubon, situated on the Nan mun (apparently in about lat. 15° 20' N., long. 104° 50' E.), a right bank tributary of the Mekong, some 500 miles from its mouth. Communication with Ubon is only possible by water during high river.

**Vinh Long** (Lat. 10° 15' N., Long. 105° 59' E.), one of the prettiest stations of Cochin-China, is 23 miles above Mitho, 48 miles from the sea. It is in daily communication with Mitho and Saigon by steam launches and vessels of the Messageries Fluviales. The climate is said to be healthy, and all sorts of supplies are obtainable. It has a fine church, telegraph office, schools, good roads, &c.

**MOUTHS OF THE MEKONG.**—**Kua Ba tak** and **Dinh an** are the two channels of the western mouth of the Mekong river. The shallow banks fronting them extend about 9 or 10 miles off-shore, and are for the most part uncovered at low water; there is a patch, over which there is only 4 feet water, 9 miles off the mouth of the Dinh an. Upon the bar of the Kua Dinh an there is a depth of about 10 feet at low water spring tides, subject to change; the Ba tak has not been properly examined.

**Kua Kong hau** and **Ko khien** are about 20 miles farther north-eastward and have a common entrance; the shallow banks fronting them extend 10 or 11 miles off, and partly uncover; upon the bar fronting the entrance the depth is about 6 feet at low-water springs. There is a clump of trees on the right bank of the Kong hau, and a fort on the left bank at the outer end of the island which separates it from the entrance of the Ko khien.

*Chart 1261, Saigon river to Kam Ranh bay.*

**The Kua Ben Nhau** (Lat. 9° 56' N., Long. 106° 47' E.), about 8 miles north-eastward, appears to be more accessible, the banks extend about 8 miles off; there is about 10 or 11 feet on the bar at low water springs, but the channel is tortuous. There is a fort upon each point of the entrance.

Weser shoal is shown on the shore bank south side of approach at about 6 miles off-shore.

A few miles farther to the north-eastward is the entrance of the Ba lai, which is only available for very light craft.

**The Kua dai** and the **Kua tieu** are the entrances to the north-eastern branch of the Mekong, fronted by the shore bank to about 10 miles.

The Kua dai has a depth of about 7 feet on its bar at low water on either side of some central banks which break at times; it is but little used.

*General charts 1261, 2660a, 1263.*

*Chart 1016, Saigon or Don nai river.*

**APPROACH TO MITHO.**—The Kua tieu, the northernmost mouth of the Mekong, is the one used by vessels ascending to Mitho, &c. On the bar there is a depth of about 8 feet, at low water, with a rise of about 12 feet at springs. Shallow banks front the entrance to a distance of about 10 miles, the edges of which are usually marked by breakers. Fishing stakes are numerous all over these banks, and occasionally a wreck. The bar is unbuoyed, and should only be crossed by those locally acquainted. There are forts on both sides of the entrance.

**Lights.**—On Mirador point (*Lat. 10° 16' N., Long. 106° 46' E.*), northern side of entrance to the Kua tieu, a *fixed red* light is exhibited from a small iron tower at an elevation of 33 feet above high water, visible at the distance of one mile.

From a small tower over a house on piles, erected near the south edge of Norodom bank, on the north side of approach, at  $2\frac{1}{2}$  miles  $112^\circ$  true from the above, is exhibited, at an elevation of 90 feet above high water, a *fixed* light, showing *red* and *white* sectors, for which see the charts and Light list. It is visible from a distance of 15 miles in clear weather. The light-tower is a pilot look-out station.

**Beacon.**—A black beacon, surmounted by a ball, is charted  $2\frac{1}{2}$  cables seaward of the pile light.

A red conical buoy, with a conical topmark, is moored near the Francis Garnier rock, situated between the two lights, at one mile from the fort light.

**Wrecks.**—A spar buoy, Norodom, painted in black and white horizontal bands, is moored in  $2\frac{1}{4}$  fathoms on the eastern edge of the shallow bank extending about  $7\frac{1}{2}$  miles to the eastward, north of the entrance to the Kua tieu, as charted, at about one mile  $81^\circ$  true of the wreck of the *Norodom*. The wreck of the *Cambodia* lies in the fairway over the bar, marked by a green buoy bearing  $161^\circ$  true, distant  $1\frac{1}{2}$  cables from it, or in lat.  $10^\circ 14' 0''$  N., long.  $106^\circ 51' 53''$  E.; these buoys are not to be depended on.

**Directions.**—Vessels should not enter the Kua tieu without a pilot. Within the entrance points the navigation is said to be easy; the left bank is followed at the distance of half a cable until abreast Rach Kahon, thence kept close aboard until Mitho is reached.

**At night.**—The *white flashing* sector of light, shown from the light at the entrance to Kua Dong tranh, west end of Kangio island, bearing about  $334^\circ$  true, will lead to off the entrance to the Kua tieu; Norodom pile light bearing  $286^\circ$  true, showing *fixed red*, apparently leads in the fairway over the bar of the Kua tieu; but a vessel should anchor outside where the two bearings intersect, in about  $3\frac{1}{2}$  fathoms, unless in charge of a pilot. It is stated, in the French Sailing Direc-

*General charts 1261, 2660a.*



*Plan of Mitho on chart 1016.*

tions, that the positions of these lights are not relatively correct, so that extreme caution is necessary.

**Mitho** (*Lat. 10° 22' N., Long. 106° 21' E.*).—The town and citadel of Mitho is situated about 25 miles above the entrance to the Kua tieu. It is connected by railway with Saigon.

**Tides.**—It is high water, full and change, at Mitho road at 3h. 50m. ; springs rise 11 feet, neaps 7 feet.

*Chart 1016, Saigon or Don nai river.*

**SAIGON or DON NAI RIVER.—The Delta.—General remarks.**—North-eastward of the mouths of the Mekong, between the Kua tieu and Cape St. James, 17 miles apart, is a large bay, within which is the delta of the Don nai, or Fuok Binh Kiang, now generally known as Saigon river.

Numerous islands, covering a space about 15 miles in length by the same in breadth, with many rivers or channels between them, form the delta ; about five of these rivers lead to the sea, and the mouths are, namely, the Soirap and Kua Dong tranh, westward of Kangio point, and the Kua Kangio (main river to Saigon), the Rach Theu and the Song Kai, on either side of Kulao Fu loi, and minor mouths.

The Saigon river is probably replenished by the inundations from the Mekong, the great river of Cambodia, as nothing in the nature of the mountains of Lower Cochin-China indicates the existence of what might be its proper sources. It irrigates all the northern part of the province of Bien Hoa, passes before the citadel of that name, and pursues its course to the southward. It does not become navigable until below the ancient barriers, at about 6 miles below Bien Hoa. From thence it follows a southerly direction, with several windings for 15 miles, where it receives the Saigon arm and forms the Tam kiang khau, which runs nearly north and south. At Fa mi point it divides into two arms ; the one turning to the westward is the Soirap, that turning to the south-eastward reassumes the name of Fuok Binh Kiang, and discharges its waters between Kangio point and Cape St. James, as before mentioned.

The Saigon arm of the Don nai is its sole affluent, and, like it, is replenished by the inundations from the Mekong river. It flows from the north-westward, leaves on its right the mountain of Badingh, passes by the Kaikong, Thu dau mot, and Dai thieu, and, pursuing a serpentine course, passes Saigon, joining the Don nai about 8 or 9 miles below that city.

**Soirap river.**—The Soirap is the western branch of the Don nai or Saigon river. At 14 miles above its entrance it joins the main river at Fa mi point.

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

The fairway depth over the bar, which lies eastward of Norodom bank, is about 19 feet at low water, but there is less water within. With Dong tranh lighthouse between the bearings of 5° true and 30° true, there is a bank in the fairway with 3 fathoms, and a channel northward of it with 3½ fathoms. Still further up, abreast the mouth of Grande Vaico (*Lat. 10° 30' N.*), is a bar with about 16 feet, above which the water is deeper. The channel is unbuoyed, and is only available by those acquainted with it, and the bar is covered with fishing stakes.

ANCHORAGE is PROHIBITED in the narrow part of this channel, from a point about one cable below the entrance to the Rach Muong Thuoi, on the western shore, to a point half a cable north of that entrance, which point is situated in *lat. 10° 40' N.*

**Kua Dong tranh** lies eastward of the Soirap, and is available by small craft with local knowledge.

**LIGHT.**—On the east point of entrance to this river, west extreme of Kangio island, from a white square tower, 80 feet in height, is exhibited, at an elevation of 73 feet, a *fixed and flashing* light, visible from a distance of 14 miles seaward, over an arc of 180°. For sectors, *see charts and List list.*

**CAPE ST. JAMES** (*Lat. 10° 20' N., Long. 107° 5' E.*), 620 feet in height, is the south extreme of the island forming the eastern boundary of the entrance to Saigon river, and is the first high land seen when coming from the south-westward, the whole of the coast from thence to the Gulf of Siam being low swampy land. The cape, with the two hills northward of it, 820 and 784 feet in height, named Nui Ganh Rai, appear as three islands when first seen at a distance of about 30 miles. (*See view A on chart 1261.*) A small islet lies close to the south-east side of the cape. For shoals off, *see pages 191, 192.*

**LIGHT.**—From a white masonry tower, 49 feet in height, erected on the summit of the hill about 8 cables within the extreme of Cape St. James, is exhibited, at a height of 646 feet above high water, a *group flashing white* light, showing a group of *two flashes every ten seconds*, visible from a distance of about 30 miles in clear weather. *See Lights for Saigon river, pages 192, 193, and that mentioned above.*

**Signal station.**—Near the lighthouse is a signal and semaphore station, with which vessels can communicate by International code, thence by telegraph with Saigon. The submarines' signal flag is hoisted here when they are exercising in the neighbourhood. *See page 191.*

**Telegraph.**—Cape St. James is the landing place of the submarine cables from Singapore, Haifong, and Hong Kong. The offices

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

of the Eastern (International) Telegraph Company are in Coccoanut bay. There is a wireless telegraph station here, call letters CSJ, open to the general public between 6 and 11 a.m., 2 to 6 p.m.

**Storm signals** are shown near the lighthouse, *see* page 32.

**COCOANUT BAY.—Sanatorium.**—Cape St. James is now the sanatorium of Cochin-China, in consequence of which the town of Vang tau (Ville du Cap), situated in Coccoanut bay, has much increased in size, and supplies of provisions of all kinds are now obtainable. Drinking water, however, is scarce, being procurable only from the tanks. Numerous batteries have been built on the heights, and troops of Marine Artillery and Infantry are stationed there. A good coach road connects Coccoanut bay with Cape Ti wan.

**Harbour.**—A mole has been built from the south-west corner of Coccoanut bay, 850 yards in length, which affords shelter during the south-west monsoon to small vessels not exceeding a draught of  $8\frac{1}{2}$  feet. The depth at the extremity of the breakwater is about 11 feet at low water, and 15 feet northward of the centre. The mole was partially destroyed by a typhoon in May, 1904, and was then covered at high water.

**A landing place** has been constructed at Ben Dinh, in Rach Dinh, within the north extreme of Cape St. James, where landing may be effected in all weather.

**Lights.**—A *fixed green* light is shown on the end of the mole at Coccoanut bay, visible in clear weather from the distance of one mile. *See* Leading and other river lights, page 192.

**Anchorage.**—There is anchorage anywhere off the west coast of Cape St. James, in about 7 fathoms, mud bottom, at the distance of about one mile. The swell is heavy here during the south-west monsoon, but the anchorage is excellent in the opposite season. There are no dangers other than the sunken rocks half a cable off-shore near the north point of Coccoanut bay. Directions for entering, *see* page 197.

**Pilot station.—Signals.**—Coccoanut bay is the pilot station for Saigon, &c. The station is connected by telephone with the semaphore on Cape St. James. There is a steam pilot-boat for boarding vessels, subject to the International regulations, on page 10.

A pilot for Saigon is compulsory for merchant vessels. It is advisable that vessels of war should also employ a pilot on a first visit, as they are acquainted with the moorings, &c., at Saigon. They are instructed to hand to all masters of vessels arriving a copy of the signals and port regulations, as mentioned on page 193. The pilot flag is blue with a square white centre.

The charge for merchant vessels is 28 centimes per ton; for vessels of war 32 francs per metre of depth.

Vessels wishing to anchor in Coccoanut bay without the assistance of a pilot are required to hoist flag D of the International code by day.

*General charts 1261, 2660a, 1263.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

and to show a *red* light at night from a position well above the gun-wale, when approaching the anchorage. See Directions, page 197.

**Exercising submarines.**—See Submarine vessels' signals, pages 10, 11.

**Ganh Rai bay**, northward of Cocanut bay, is encumbered with a flat extending about 2 miles from its eastern shore, and is covered with fishing stakes.

The Chava and the Rach dua discharge into Ganh Rai bay, the latter continues eastward under the name of Song Dinh; these streams meet at about a mile southward of Baria, which is only accessible to boats. At the junction they run as one stream, south-eastward, under the name of the Rach lap; finally, after a tortuous course, discharging into the sea between Cape St. James and Cape Ti wan.

There is anchorage for small craft in the entrance of these rivers, eastward of Ganh Rai bay, during the north-east monsoon period; two *fixed white* lights, as leading marks, are erected on the left bank of the Song Dinh, for those entering that branch. *Green* lights are shown on the landing stages at Song Dinh and Rach Dua.

**SAIGON RIVER.**—**Depths to Saigon.**—The Fuok Binh Kiang or Saigon river, close eastward of Kangio point and fort, is the channel used by vessels of deep draught. It has a depth of 23 feet in the fairway in the shallowest portion of it, namely, over a coral bank or bar that has been dredged to that depth about 23 miles above Kangio point, and about 20 miles below Saigon. The channel northward of Kangio red light has only 4 fathoms; heavy draughts should not navigate here at or near low water; springs rise 12 feet.

The Messageries Maritimes steamers, of about 25½ feet draught and 6,357 tonnage, go up to Saigon city.

The main river is said to be navigable up to within 6 miles of Bien Hoa, as before stated, or 15 miles above the arm that leads to Saigon.

The Soirap and Dong tranh, to the westward, have been described.

**DANGERS in the approach to Saigon river.**—The bank fronting the entrances to the eastern branches of the Mekong, to the distance of about 12 miles, has been previously referred to. Cape St. James lighthouse, bearing northward of 23° true, will keep a vessel clear of these banks.

**Kangio or Bassok bank** forms the western side of entrance to Saigon river. It extends 5½ miles south-eastward of the land south-westward of Kangio point, and dries from 3 to 4 feet in places for about 3½ miles off-shore, with depths of less than 3 fathoms over the remainder. Its eastern edge, where there is a charted depth of 1½ fathoms fairly close to the 5-fathoms contour, is 1¾ miles distant

*General charts 1261, 2660a, 1263.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

from the eastern side of the entrance northward of Cocoonut bay, with a depth of 6 to 10 fathoms between. The bank is covered with fishing stakes out to the depth of 3 fathoms in places.

Abreast Cape St. James, distant about  $1\frac{1}{2}$  miles, is the extreme of a tongue of Kangio bank, with a depth of  $4\frac{1}{2}$  fathoms, and with less water between this extreme and the 3-fathoms contour of the bank.

**Ranza shoal** has been dredged to a depth of  $4\frac{1}{2}$  fathoms; it lies in the fairway, between Cape St. James and the tongue of Kangio bank, about 8 or 9 cables from the extreme of the cape. The best channel is westward of it, in not less than 5 fathoms, on the line of the leading lights, as charted. The depth of  $4\frac{3}{4}$  fathoms on the south-east extreme of the tongue of Kangio bank lies near to the line of the lights.

**Formosa bank**, within a depth of 3 fathoms, is about a mile in length by half a mile in breadth, with a least depth of  $1\frac{1}{2}$  fathoms on its north-west extreme, situated with the extreme of Cape St. James bearing  $294^\circ$  true, distant one mile. It is composed of hard sand, with depths of  $3\frac{3}{4}$  to  $4\frac{1}{2}$  fathoms, extending nearly  $1\frac{1}{2}$  miles east-north-eastward of it.

About  $1\frac{1}{2}$  miles south-westward and southward, and to  $4\frac{1}{2}$  miles south-eastward of Formosa bank, are several shoals, with less than 5 fathoms; on one of these there is but  $3\frac{1}{2}$  fathoms, with the extreme of Cape St. James bearing  $294^\circ$  true, distant  $3\frac{1}{2}$  miles; a patch with  $4\frac{1}{2}$  fathoms lies  $95^\circ$  true  $2\frac{6}{10}$  miles from it, and others may exist. The lighthouse bearing  $9^\circ$  true, or northward of that bearing, leads westward of all these banks. The bay between Cape St. James and Ti wan is shallow, the outer limit of which,  $4\frac{1}{2}$  to  $4\frac{3}{4}$  fathoms, with 6 to 8 fathoms close-to, lies  $230^\circ$  true about  $3\frac{1}{2}$  miles from Cape Ti wan.

**Pernambuco rock**, with  $1\frac{1}{2}$  fathoms water, lies  $143^\circ$  true, 2 miles from Cape Ti wan. A patch of 3 fathoms is charted  $145^\circ$  true  $1\frac{1}{2}$  miles from Pernambuco rock; position approximate. Other shallow patches are charted within this position on either side of Pernambuco rock, where the bottom is very irregular. It is advisable not to get into less than 10 fathoms when passing Cape Ti wan.

**LIGHTS.**—The light on Cape St. James has been described on page 189. The following lights apply to the navigation of Saigon river.

**Leading lights.**—**Front light.**—On the northern point of Cocoonut bay is exhibited, from a white square tower, at an elevation of 65 feet, a *fixed red* light, visible in the entrance from  $8^\circ$  true through north to  $338^\circ$  true.

**Rear light.**—On the western part of Ganh Rai, at a distance of  $1\frac{2}{10}$  miles  $353^\circ$  true from the front light, is exhibited, at a height of

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

426 feet from a white square tower, with keeper's dwelling adjacent, a *fixed red light*. These lights in line bearing 353° true lead between Ranza bank and the tongue of Kangio bank.

The lights at the mouths of the Kua Dong tranh and Kua tieu, previously described, are useful in fixing the position of a vessel approaching from the offing.

**River lights. — Kangio bank** (Lat. 10° 24½' N., Long. 107° 0½' E.).—A *fixed white light*, visible in clear weather from a distance of 7 miles, is exhibited at an elevation of 32 feet above high water from a pile lighthouse on the north-east edge of Kangio bank, at about 5½ miles 318° true of Cape St. James lighthouse. The light is obscured over the banks on the western side of Saigon river entrance.

**Fuok binh kiang.**—A *fixed red light*, elevated 33 feet above high water, and visible from a distance of 7 miles, is exhibited from a pile lighthouse, close to the edge of the shallow bank on the west side of Saigon river, 311° true, distant 2¾ miles from Kangio point.

At about 8 cables northward from the lighthouse there is an iron framework beacon, upper half painted white, lower half black.

**Rach Gioi.**—A *fixed green light* is shown from an iron support, 26 feet in height, 100 yards northward of the mouth of the Rach Gioi, west shore of Saigon river, 2½ miles above Fa mi point, visible at the distance of 7 miles.

**Don nai.**—A *fixed red light*, visible at the distance of one mile, is exhibited from an iron support at the south point of the junction of the branch that leads to Saigon city.

**SIGNAL STATIONS. — Distinguishing signals.**—There is a semaphore station close to the lighthouse on Cape St. James, in connection by telegraph with Saigon, as before mentioned; there is also a signal station at Fa mi point, 4 miles below the Saigon branch below referred to.

A copy of the following instructions and of the port regulations should be given by the pilot to the master of every vessel going up to Saigon.

Every ship going up the river, which is desirous of taking, without stoppage or delay, a berth in the commercial harbour of Saigon, should, after having passed the bank of the point of junction of the Don nai and of the Soirap, draw near to the right bank, and endeavour to attract the attention of the signalman of the Nha Bé reach of the river, situated on Fa mi point, by making heard, by means of the steam whistle or siren, prolonged and repeated sounds at intervals of 10 to 20 seconds, until she has arrived abreast of the Rach Gioi, or has been sighted, as will be stated further on.

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

She should, at the same time, have flying, besides her National flag, the following distinguishing signals:—

**Mail steamers.**—By DAY.—If a mail packet the mail flag and her company's flag, and, besides, the quarantine flag, if, finding herself in one of the cases provided for by the local orders, and by the decree with reference to the sanitary police, she must, before obtaining free pratique, be subjected to the visit of the sanitary medical officer (a hospital exists at Nha Bé).

By NIGHT.—If she is a mail packet, the mail lights, the quarantine light, if necessary, and two white lights, visible for 2 miles in clear weather from all points of the horizon, hoisted at the head of the mizen-mast, and placed vertically one above the other at an interval of 5 feet.

**Other vessels.**—By DAY.—If an ordinary commercial vessel, her number in the International code, and the quarantine flag if necessary, as before stated.

When the ship going up river does not immediately proceed to a berth in the Commercial port, either because she has to stop in Nha Bé reach to discharge petroleum in the warehouse of Rach Gioi or explosive material at Nha Bé, or because she wants to anchor before entering in order to wait a change in the current, she will hoist besides the signals indicated above, the signal *I must anchor*; and when ready to proceed to the port the signal, *I am getting under way*, or, *I shall get under way at the hour indicated*, by hoisting the signal of the hour upon another halliard.

By NIGHT.—When the ship going up should not immediately take her berth in the harbour, she will use her steam whistle or siren, as stated above, but will not hoist the two white lights aft, the particular meaning of which is just that the ship is going into harbour.

**Communication with the commercial harbour.**—As soon as the signalman at Fa mi point perceives a ship carrying the distinguishing signals indicated above, he gives notice, by telephone, to the commercial harbour of the passage to Nha Bé of the ship, and of the nature of the signals which she carries, saying if she is a mail ship or an ordinary ship, if she has the quarantine signal, and if she indicates by her signals that she is not going immediately to her berth.

If the reply from the Commercial port indicates only a receipt of the communication, the signalman hoists, immediately, at the head of the signal mast, by day, the answering pendant of the International code, and by night, a white lantern, visible in clear weather at 2 miles over all points of the horizon.

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

If, for any reason, the Captain of the port judges that the ship should not enter the harbour for lack of room, for instance, or if the ship carrying petroleum should discharge her cargo at the warehouses of Rach Gioi, he informs the head of the station of Nha Bé of it, who, instead of hoisting the answering signal, will hoist one of the following signals:—

*Anchor in the bay*, which, in this particular case, will mean: *Anchor at the petroleum station of Rach Gioi*, or, *Anchor as soon as you like*, which will mean: *Entrance to the harbour is prohibited to you, and you must anchor before arriving there.*

The ship, thenceforth, will be free to anchor either in the Nha Bé reach, except at the prohibited anchorage between Rach Ong dien and the stream to the northward of Rach Gioi (or between the latitudes 10° 39' 7" N. and 10° 42' 5" E.), within sight of the signal mast, so as to be able to see the signal *Get under way as quickly as you can*, which will indicate to her that the prohibition of entry is removed; or between the Stozenfelds and the second bend, where she will await the orders of the Captain of the port, which will be sent to her, by a steam launch, as soon as this is possible.

This last anchorage should also be taken by every ship to the distinguishing signals of which the signal station at Fa mi point shall not have acknowledged by the answering signal; but, in this case, she will endeavour to attract the attention of the harbour authorities by prolonged and repeated sounds of her steam whistle or siren.

**MAIN CHANNEL to Saigon.**—The channel of the approach to Saigon river forms an elbow to Kangio point, the first land met with on the west side when entering, about 6 miles above Cape St. James lighthouse. It is 10 miles in length, and between the north point of Coccanut bay and the Kangio bank, 1½ miles in breadth, as before mentioned with that bank, gradually narrowing to three-quarters of a mile abreast Kangio point, where the river is usually considered to begin, and near where the chart shows it has shoaled to 4 fathoms. The bottom of the channel is soft mud, with depths of 7 to 12 fathoms, and vessels many anchor in any part of it. The best anchorage during the south-west monsoon is northward of Kangio point.

The entrance of the river at Kangio point cannot be made out when distant, the land being very low and covered with brushwood. The best mark was formerly a remarkably small clump of trees of moderate height, on Kangio point; the pile lighthouses are now probably the best marks.

Kangio is a small fishing village on Kangio point, west side of river.

*General charts 1261, 2660a.*



*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

**Banks** which are steep-to, front the shore in places, but not to any great extent; above the beacon on the west shore, 3 miles above Kangio, there are practically none until near Coral bank is approached, provided the vessel follows the bends of the river and avoids the points; there is said to be one exception to this, there being a mud bank in the bend 2 miles below Coral bank, extending two-fifths of the distance across the river, but the present charts do not show it.

*Plan of Coral bank cutting on chart 1016.*

**The Coral bank** (*Lat. 10° 37' N., Long. 136° 51' E.*) has a dredged channel through it from 560 to 620 feet in width, with about 23 feet at low water. Here the channel is close round the point, the bend opposite being somewhat encumbered with the undredged reef.

**Beacons.**—Two beacons erected on the north shore of the bend northward of Coral bank, when in line bearing 334° true, lead through the dredged channel, but rather on the westward side of it; the helm should be altered in time to continue through the cutting with the two beacons on the eastern shore, in line astern bearing 116° true, which leads through.

*Chart 1016, Saigon or Don nai river.*

**Wreck.**—The wreck of the s.s. *Carlisle*, with mast, funnel, &c., above water, lies near the eastern bank, about a mile northward of Fa mi point, out of the fairway.

The bend above Fa mi point should be closely followed to avoid the Ville de Paris bank, nearly awash in places, and composed of sand and rock, which extends nearly half-way across from the eastern bank of the river. At the junction with the Ben ghé, the Saigon branch, the main river is barred by Kaobang bank (which has a low water depth of 2½ fathoms over it), the channel to Saigon being between this bank and the south point of the branch, marked by a red light, and which is free from danger. Above this the channel is clear up to the city.

**Tides.**—It is high water, full and change, at Cape St. James at 2h. 30m., and at Kangio half an hour later; springs rise 12½ feet. The spring tides are said to run strong, but they are probably of less strength than at Saigon, below mentioned; the ebb lasts longer than the flood. Neap tides are feeble and irregular. On the Coral bank up the river, high water occurs one hour before high water at Saigon; and the rise is the same.

At Saigon the tidal streams, which are tolerably regular about the springs, run about 2 knots, but sometimes attain a speed of 4 knots (probably in the rainy season); it is high water, full and change, at 4h. 30m., or about 2 hours later than at the entrance, and the spring rise is 12 feet.

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nài river. Var. about 2° E.*

**Pilots.**—See page 190.

**Tugs** are available, and sailing vessels are recommended to employ them.

**DIRECTIONS.**—There is no difficulty in a steam vessel approaching Saigon river, Cape Ti wan and Cape St. James, with its lighthouse being capital landmarks, and going up to Saigon on the one tide; the large vessels of the Messageries Maritime do so, as before mentioned. See remarks on pilots, page 190.

In thick weather careful attention to the lead will keep a vessel clear of the banks which front the mouths of the rivers to the southward.

Coming from the north-eastward, Britto bank and the shoals off Cape Ba ké should be given a wide berth. See views on chart 1261.

A careful lookout should be kept for any submarine vessels that may possibly be exercising in the neighbourhood of the entrance. They are sometimes at anchor with their escort in the bay northward of Cape St. James, the same flying the prescribed flag. Craft visiting this shallow bay should at such times proceed slowly past the submarines and give them a wide berth.

Vessels meeting the submarines in the river are to pass on that side of the escorting vessel indicated by the waving of a flag. For signals, lights, &c., see pages 10, 11.

To proceed into and up the river.—The two western points of Cape St. James peninsula kept in line, bearing 348° true, lead in between the shallow banks on either side of the approach, passing close westward of Ranza shoal, of 4½ fathoms, in a depth of about 4¾ fathoms.

A better mark, if they can be distinguished, is the leading mark white lighthouses on those points in line bearing 353° true (*red fixed lights at night*).

From abreast Cape St. James lighthouse, keep about three-quarters of a mile off-shore, following the pecked line on the chart until Cape St. James lighthouse is over the north point of Cocoanut bay, bearing 148° true, which mark, astern, will lead up the fairway to the river entrance eastward of the lighthouse on Kangio bank, until that lighthouse bears 233° true. Vessels can anchor here, in Ganh Rai bay, if advisable, before proceeding up river to Saigon.

If proceeding up, with Kangio light 233° true, as just mentioned, Fuok Bing kiang light will bear 295° true, steer direct for it on that bearing, but edging a little southward when near the shoals off the south extreme of Kulao Fu loi, to keep on the pecked line. When about half a mile from the light haul northward, and keep in mid-channel, as charted. As before stated, the bend 2 miles below Cora.

*General charts 1261, 2660a.*

*Chart 1016, Saigon or Don nai river. Var. about 2° E.*

bank is said to be filled up with mud to two-fifths its distance across the channel; it should be given a berth.

The river is somewhat tortuous for a long vessel, but nevertheless is easily navigated with proper care. Leading beacons are established for crossing the Coral bank, for which *see* Banks in the river, page 196. *See* Signal station, Fa mi point, pages 193, 194, above which vessels cannot proceed without permission.

Above Fa mi point, keep the western shore aboard to avoid the Ville de Paris bank; thence steer fairly close around the point marked by a red light to avoid the bank in the main river on the opposite side, into the Saigon branch, in which there are no dangers below the city.

The best time to arrive at Saigon city is at high water, or on the first of the ebb, as the vessel will be more easily berthed.

**Sailing vessels.**—In the north-east monsoon sailing vessels from the southward should make the land to windward of the port, or they may be set to leeward of Cape St. James, and towards Kangio bank, by the prevailing current, accelerated by the flood stream. During the ebb, however, the current is at times overcome, and there may be a north-easterly set.

At about 90 miles from the coast, the wind in settled weather usually hauls to E.N.E. and East about 4 p.m., continuing all night fresh and puffy. This is the time for sailing vessels to stand in-shore, and although as far to leeward as the meridian of Cape St. James, with the ebb tide under the lee, the vessel will be to windward of Cape Ti wan in the morning.

For entering and proceeding up river, *see* the preceding directions; a pilot is compulsory for merchant vessels.

**In the south-west monsoon.**—From abreast Pulo Condore, steer to pass along the edge of the bank fronting the delta of the Mekong, and extending to the mouth of the Saigon river.

Strong freshets run out of these rivers during this monsoon, and join the north-easterly current, whereby vessels are obliged to keep the edge of the bank aboard to prevent being set to leeward of Cape St. James. The lead should be kept constantly going while steering along the edge of the bank, keeping in not less than 10 fathoms. Should the water begin to shoal, haul off to the eastward, when it will soon deepen, as the depths are fairly regular.

Continue along the edge of the bank in these depths until Cape St. James bears northward of 30° true, when course may be steered as requisite for the entrance.

Above Cape St. James a sailing vessel will be in charge of a pilot and probably in tow, so that it is not necessary to offer further directions.

*General charts 1261, 2660a.*

*Plan of Saigon on 1016.*

**ANCHORAGE.**—The limits of the Port of Saigon are the Arroyo de l'Avalanche, at the north extreme of the town, and the mouth of the Dong Ong to,  $3\frac{1}{2}$  miles below the time signal, the Commercial port being all that portion southward of the time signal; extensive wharfage, constructed at great cost and under considerable difficulties, was completed in 1907; cargoes are now handled with rapidity. All vessels are berthed under the direction of the Harbour Master.

The northern portion of the port, that is, above the time signal, has several mooring buoys in depths of 5 to 7 fathoms, and is reserved for vessels of war.

In the Commercial port vessels are moored head and stern between mooring buoys, or are berthed alongside the wharves. There are large petroleum stores in the main river at the Rach Gioi, above Fa mi point.

At the entrance of the Arroyo Chinois is the Custom house and the signal station of the Commercial port, which is connected with that at Fa mi point (pages 193, 194). This branch of the river is spanned by a handsome bridge, has numerous wharves and quays alongside which vessels load and discharge, and every facility in the way of mooring buoys and posts for mooring to or hauling off.

**Prohibited anchorages.**—No vessel is allowed to anchor in the river, except below the lower moorings and out of the fairway at a long distance from the city, and no vessel is allowed to anchor in the river, unless in case of necessity, within one mile on either side of the sharp curves of the river such as near the Coral bank cutting. Vessels are prohibited from anchorage between lat.  $10^{\circ} 39' 7''$  N. and  $10^{\circ} 42' 5''$  E.; the signal station at Fa mi point is about midway between these limits. See also signals, page 194.

**The CITY of SAIGON** (Lat.  $10^{\circ} 46'$  N., Long.  $106^{\circ} 42'$  E.) stands on the west bank of the Ben ghé branch of the Don nai or Saigon river, about 48 miles from Cape St. James; it is the capital of the French possessions in Cochin-China, and has undergone considerable alterations. Broad streets lined with trees, bordered by fine European houses, and public gardens testify to the wealth of the colony; canals have been carried through the principal parts of the town, whilst about two-thirds of the frontage on the river is now occupied by Government establishments. The principal objects are the cathedral, the gothic chapel of Saint Enfance, the palace of the governor, the prison, and the military hospital.

The city is situated between two small rivers, the southern one of which is named Arroyo Chinois, the principal centre of trade extending about  $2\frac{1}{2}$  miles up this river to Cho lon, or Chinese Town, mentioned

*General charts 1261, 2660a.*

*Plan of Saigon on 1016.*

below; the northern stream is named Arroyo de l'Avalanche; their distance apart is about  $1\frac{1}{4}$  miles.

The business part of the city is the southern portion, northward and westward are the residences of the governor and principal officers, situated on some rising ground nearly half a mile from the river.

**Population.**—The population of Saigon proper in 1905 was 54,745, exclusive of the Naval and Military forces. The French population numbered 8,749; other Europeans 152, Chinese 14,000, Annamites about 30,000.

Cho lon, or Chinese Town, about 2 miles south-westward, has a population of 140,000. It is the mart for all produce of the colony and of Cambodia, is the residence of all Chinese merchants, and the rice mills are situated therein.

**Supplies.**—All sorts of fresh food are obtainable, and good water is supplied by tank boats from the reservoirs on the hill westward of the city.

**Coal** can be brought alongside in lighters. About 200 tons can be put on board in a day and 300 tons working day and night. About 60,000 tons are imported annually, and about 17,000 tons are kept in stock. The quay at which steamers may coal has a depth of 30 feet alongside.

**Docks.**—There are two Government dry docks at Saigon. See Appendix II., page 559.

There is a basin, 240 feet in length by 78 feet in breadth, in which vessels of 13 feet draught can be repaired.

A floating dock is building, 400 feet in length, 66 feet in inside width, to lift vessels of 10,000 tons.

The Government machine shops are capable of doing all sorts of work; there are floating steam cranes with a lifting power of 30 and 50 tons. The Cie. Messageries Fluviales can also undertake heavy repairs.

**Hospital.**—There is a military hospital, with 200 beds, where seamen of all nations are received.

**Shipping.—Trade.**—The total number of vessels of all nations which entered the port in 1911 was 553, of the aggregate tonnage of 975,892 tons. About half the tonnage applies to the French mail steamers visiting the port; there was only one sailing vessel.

The aggregate value of the exports for the year 1910 was 197,910,845 francs, and the imports 160,311,811 francs.

*General charts 1261, 2660a.*

*Plan of Saigon on 1016. Var. about 2° E.*

The chief exports are rice, salt, fish, silk, cotton, pepper, and cardamoms; the imports consist of Chinese merchandise, English calicoes, silks, opium, tea, wines, and drugs.

Saigon is no longer a free port.

**Communication.**—The Messageries Maritimes run two lines of steamers from Saigon in connection with their main line; the one, bi-monthly, does the service of Annam and Tong King to Hong Kong, calling at Nhatrang, Kin Hon, Tourane, and Haifong, &c.; the other, monthly, between Saigon and Manila.

Saigon and Mitho on the Mekong are connected by a railway 55 miles in length, and with Bao Chang about 63 miles. A tramway connects Saigon with Cho lon. The innumerable streams which intersect Cochinchina afford every facility for transporting the products of the country. There is a weekly service from Saigon to Khone on the Mekong, during the favourable season, and another to Ubon, referred to with the Mekong, page 185; the river could be made navigable for steamers of 3 feet draught from Kratie to Strung Streng, *see* pages 184, 185.

**Telegraph.**—The telegraph service of Cochinchina and Tong King are connected by submarine cable from Cape St. James with Singapore and Hong Kong, thence with all parts of the globe. Office at Saigon is always open.

**Time signal** (*Lat. 10° 46' 40" N., Long. 106° 42' 21" E.*).—A ball is dropped from the signal mast in the commercial harbour at noon, Saigon mean time corresponding to 16h. 53m. 11.7s. Greenwich mean time. The ball is dropped a second time at 17h. 0m. 0s. Greenwich mean time, or standard time of the 105th meridian east of Greenwich.

**Climate.**—Like most tropical countries there is a dry and a wet season at Saigon; the former corresponds to the period of the north-east monsoon, and the latter to that of the south-west monsoon. The mean temperature varies from 71° to 86°, but at times in the dry season it reaches 93° in the day time, sinking to about 70° at night; this is the period of fine weather with a clear sky and fresh breezes, and Saigon is then not a disagreeable place to live in, though the temperature shown is high; occasional gales of short duration are experienced.

In the south-west monsoon period, from May to September, the atmosphere is hot, humid, and very distressing to the body; but the heat is somewhat lessened by the cloudy sky and the daily showers.

The hottest months are from March to June, when the temperature is as much as 100° at times. *See* Meteorological table, from a number of years, page 563.

Health at Saigon has been much improved in late years, from a better understanding of the prevalent diseases, and from the increased

*General charts 1261, 2660a.*

*Plan of Saigon on 1016. Var. about 2° E.*

comforts of living. Bathing, moderate exercise in the shade, spare regular diet, and ample rest, are the best preventatives. Exposure to the sun, indolence, irregular diet, excess of fatigue and of drinking, must be avoided.

**Winds.**—In December, January, February, and March, the monsoon at Cape St. James is steady and strong, with dry hot weather; it then gradually abates in strength until it ceases. The land and sea breezes then become steady, generally blowing from E.N.E. and sometimes from N.E. during the night, and drawing round to the East in the morning; the sea breeze then generally sets in from S.E. towards noon, or early in the afternoon.

In the river, with fine weather during the north-east monsoon, it falls calm during the night, and in the morning a light breeze springs up from the N.E. which freshens as the day advances, veering through east, and in the afternoon blowing from the S.E. It blows very fresh during the day, moderate towards the evening, and falls at night.

In the south-west monsoon the winds are variable between West and S.W. The sea breeze blows fresh up the river, gradually dying away in the evening. In settled weather the wind is from S.W. to S.E., and sometimes E.S.E. at Cape St. James.

**Typhoons.**—A typhoon passed over Saigon during the afternoon of May 3rd, 1904, doing much damage to property, and causing vessels to break adrift; considerable injury was done to native craft. There was at the same time a heavy storm on the coast, which was also felt at the smaller ports of the district. A typhoon passed over Pulo Condore in November. It is not safe to assume they will not be met with southward of Cape Varella. A typhoon at Saigon is of rare occurrence. See Signals, page 32.

*Chart 1261, Saigon river to Kam Ranh bay.*

**COAST.—Kua lap.**—Between Cape St. James and Cape Ti wan, 10 miles eastward of it, the coast forms a shallow bay, into which the Rach lap discharges. Its bar, Kua lap, has a depth of about 2 feet, obstructing the entrance to the river, which leads into Ganh Rang bay, in Saigon river, by the Song dinh and Chavia, before described. Probably only used by fishing craft.

**CAPE TI WAN** (*Lat. 10° 22½' N., Long. 107° 15' E.*), 10 miles east-north-eastward of Cape St. James, attains a height of 984 feet at 1½ miles within it, and will usually be seen before Cape St. James. The coast between these capes is low, and the bay very shallow, especially in its eastern portion, where the depth is only 2 fathoms at nearly 3 miles from the shore. At the head of the bay, close westward of the cape, is the village of Fuok tin.

**Shoals.**—The dangers off Cape Ti wan have been described with those in the approaches to Saigon river, pages 191-192.

*General charts 2660a, 1263.*

## COAST OF ANNAM.

**General remarks.—Winds.**—The monsoons blow nearly parallel to the coast of Annam, and are established about the middle of May and the middle of October, the south-west monsoon being generally preceded in April by about a month of calm weather. To the northward of Cape Padaran the north-east monsoon is generally stronger than to the southward. During the south-west monsoon, land and sea breezes occur tolerably regularly; the land breeze commences towards midnight, and falls about 7 or 8 a.m.; the sea breeze, generally from S.E., commences about noon, and dies away about 8 p.m.

**Typhoons** are rarely met with south of Cape Varella, but occasionally one has visited Saigon, *see* page 202.

North of Cape Varella they occur each year, particularly in September and October. Telegraphic warnings are issued to all the ports in French Indo-China from the observatory near Haifong. *See* Signals, page 32.

**Currents.**—From the entrance to Saigon river to Cape Padaran the currents are weak, and rarely exceed a mile an hour; they are strongest between Cape Padaran and Cape Varella, varying in velocity from 2 to 2½ miles an hour, and sometimes in the north-east monsoon attaining a speed of 4 miles. Between Varella and Kin Hon they are moderate, and run at most 1½ miles an hour; between Kin Hon and Kulao Rai, about 2 miles, and about the same between the latter and Tourane. In August and September the current is feeble between Varella and Tourane; a current setting S.S.E. about three-quarters of a mile has been observed. During the strength of the south-west monsoon the current sometimes attains a rate of 2 to 2½ miles, between Kulao Rai and Chumai.

**Tides.**—The tides are very irregular on this coast, as well as all over the China sea, depending mostly on the declination of the moon. *See* Chapter I., pages 40, 41.

**Caution.**—The direction of the current is with the wind, and as a rule nearly parallel to the coast, but at times subject to sudden changes. The mail steamer *Admiral Neilly* reports that in July, 1906, on passage from Haifong to Saigon, a northerly set of 2 to 3 miles an hour was experienced, and 6 days later, on the return voyage, the current was running in the opposite direction at the same rate.

**Fogs.**—The coasts of Annam and Tong King are subject to fogs, and during the rainy season the high land is often masked, and coupled with the varying currents renders it necessary to keep the lead going and to take every precaution when navigating near the shore.

*Chart 1261, Saigon river to Kam Ranh bay.*

**CAPE BA KÉ** (Lat.  $10^{\circ} 29\frac{1}{2}'$  N., Long.  $107^{\circ} 31'$  E.), 394 feet in height, is situated about 17 miles east-north-eastward of Cape Ti  
*General charts 1261, 2660a, 1263.*



*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

wan, and is the boundary between Lower Cochinchina and Annam. A range of sandhills extends from it westward to Tram point, which is from 120 to 150 feet in height, and formed of yellowish-white sandhills.

Just westward of Tram point is the village of Tuok ai xa, and farther westward in the bay formed between it and Cape Ti wan, are the villages of Xich Ram and Fuok ai (or Loi Rê), the former at the mouth of a stream of the same name. This bay is fronted by a bank with less than 3 fathoms to the distance of 2 miles, seaward of which is an isolated bank  $2\frac{1}{2}$  miles in length, with a least known depth of  $3\frac{1}{2}$  fathoms at 4 miles off-shore.

A shoal, with 4 feet water, within the 5-fathoms line, lies  $1\frac{1}{2}$  miles eastward of Tram point.

**Ba Ké shoals**, a number of isolated patches, having from  $3\frac{1}{2}$  to 5 fathoms water over them, and 6 to 8 fathoms around, lie immediately abreast Tram point; the outermost, with  $4\frac{1}{2}$  fathoms, lies with Cape Ba Ké bearing  $358^\circ$  true, distant 8 miles. The easternmost of these shoals is apparently a small pinnacle rock, with a depth of about 2 fathoms, and 7 to 10 fathoms close around, situated with Cape Ba Ké bearing  $325^\circ$  true, distant 6 miles, and Cape Ti wan, about  $261^\circ$  true. The steamship *Glamorganshire* was wrecked on it in 1897; it was not known before. The position given is from a French survey.

These dangers, from the water shoaling suddenly over a hard bottom, cause overfalls, particularly near the edge of the shore bank; but out in a depth of 10 to 12 fathoms the bottom is generally soft, and the depths regular. These shoals will be avoided when proceeding eastward by keeping Cape Ti wan northward of  $275^\circ$  true, until Cape Ba Ké bears westward of  $317^\circ$  true. See view B on the chart.

In hazy weather vessels should not get into less than 12 fathoms.

**Tides.**—It is high water, full and change, at Cape Ba Ké at 1 hour 45 minutes. Springs rise 13 feet.

**Britto bank**, named after a Portuguese captain who lost his vessel upon it, is about  $1\frac{1}{2}$  miles in extent, and consists of four shoal patches, on which the least depth is  $1\frac{1}{2}$  fathoms, on the southern one, from which the summit of Cape Ba Ké bears  $275^\circ$  true, distant about 20 miles, and Cow island  $348^\circ$  true,  $10\frac{3}{4}$  miles, or in *lat.*  $10^\circ 28\frac{1}{2}' N.$ , *long.*  $107^\circ 50\frac{3}{4}' E.$  There are depths of about 10 fathoms around the bank. The bank is not marked, as the buoys were being constantly washed away.

**Channel within Britto bank.**—The depths for about 12 miles eastward of Cape Ba Ké decrease regularly towards the shore, but between Britto bank and the coast there are known to be several

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

shallow patches, and as others may exist, except in small craft this channel is better avoided.

The outermost of these, with  $3\frac{1}{2}$  fathoms, lies about midway between and 6 miles from the nearest land, with the summit of Cape Ba Ké bearing  $261^\circ$  true, distant about 15 miles.

A patch of  $2\frac{1}{2}$  fathoms lies  $2\frac{1}{2}$  miles  $340^\circ$  true of it within the 5-fathoms contour line, apparently the south-west extreme of the shallow bank fronting the coast. Patches of  $4\frac{1}{2}$  fathoms lie without the 5-fathoms contour line for about 3 miles to the westward of the shoals just described.

**Directions.**—Coming from the south-westward, the summit of Cape Ba Ké, bearing  $268^\circ$  true, astern, will lead between Britto bank and the  $3\frac{1}{2}$ -fathoms patch 5 miles in-shore of it; a vessel will be eastward of the latter when Cow island bears  $7^\circ$  true and of Britto bank, when Kega point lighthouse bears  $30^\circ$  true; the channel should only be used by small craft. Mount Tai Ku (Nui tra Kau), 9 miles within Kega point, is a good mark for clearing these banks.

In thick weather it is not advisable to approach Britto bank under a depth of 16 fathoms.

**Cow island** (*Lat.  $10^\circ 39' N.$ , Long.  $107^\circ 48' E.$* ), situated 20 miles east-north-eastward of Cape Ba Ké, is a small round island with its summit covered with trees; it lies about a mile from the coast, and  $1\frac{1}{2}$  miles off the entrance of a stream; the depths decrease regularly towards it.

Between Cape Ba Ké and Cow island the land is low, and wooded in parts near the sea.

**Laghi.**—In the bight between Cow island and Kega point is the village of Laghi, at the mouth of a stream, north-west of which is a range of low hills. Patches of  $4\frac{1}{2}$  and  $4\frac{3}{4}$  fathoms lie 5 and 6 miles, respectively,  $143^\circ$  true of the village, with depths of 7 and 8 fathoms around them.

• **KEGA POINT** is the extremity of a tongue of low land the prolongation of a spur from Mount Tai Ku, terminating in Kega islet, on which is a conspicuous lighthouse.

Inland the country is high, and the regular sloping mountain Tai Ku (Nui tra Kau) attains a height of 1,312 feet, at 9 miles north-west from Kega point. This mountain is visible a considerable distance from seaward, being the most conspicuous land in this part of the coast, and detached from any other high land.

**Shoals.**—About 4 miles  $258^\circ$  true from Kega point, and  $2\frac{1}{2}$  miles from the shore, is a patch of  $2\frac{1}{2}$  fathoms, fine sand, within the

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

5-fathoms line. Between it and the point, at half a mile off-shore, is a patch with  $2\frac{1}{2}$  fathoms. The lighthouse on Kega islet, bearing  $47^\circ$  true or northward of that bearing, leads eastward of these patches, and of the patches of  $4\frac{1}{4}$  and  $4\frac{3}{4}$  fathoms south-westward of them.

Abreast and to the eastward Kega point is bold.

**LIGHT** (*Lat.  $10^\circ 42' N.$ , Long.  $108^\circ 1' E.$* ).—From an octagonal granite tower on Kega islet, 115 feet in height, is exhibited, at an elevation of 213 feet above high water, a *fixed white* light, with a *white flash every two minutes*; the flash is visible 21 miles, and the *fixed* light 17 miles in clear weather. See view from the eastward on page 207.

**Tides**.—It is high water, full and change, at Kega point, at noon. Springs rise 13 to 14 feet. The tidal streams are only felt along this coast during calms; the flood sets south-westward, the ebb north-eastward.

**Pulo Cecir de Mer** (*Lat.  $10^\circ 33' N.$ , Long.  $108^\circ 37' E.$* ).—For the description of this island and the banks north-west of it, see pages 103-105.

**Madge bank**, discovered by Captain C. D. Madge, ss. *Recorder*, 1887, lies with Kega point lighthouse  $276^\circ$  true, and Viné point  $356^\circ$  true, distant 15 miles. It is about  $1\frac{1}{2}$  miles in extent, with depths of 8 to 10 fathoms over a coral bottom.

**Fanthit bay** lies between Kega point and Viné point, 22 miles to the north-east, with the town of same name on a stream, about midway between.

Rocks, some above water, lie half a mile south-west of the entrance to the river; a white conical buoy is placed south-east of them, in a depth of 3 fathoms, with the Custom house at Fanthit bearing  $7^\circ$  true. About  $2\frac{1}{2}$  miles south-westward of Fanthit, and about  $1\frac{1}{2}$  miles from the shore, there is anchorage in 4 to 5 fathoms.

The South coast railway, from Saigon, is completed to Fanthit (1910).

The village of Fogia is situated on the west side of the mouth of a stream about 3 miles eastward of Fanthit; a wooded hill lies eastward of it.

**LIGHT** (*Lat.  $10^\circ 55' N.$ , Long.  $108^\circ 7' E.$* ).—A *fixed white* light, elevated 38 feet above high water, and visible in clear weather from a distance of 8 miles, is exhibited from an iron trellis-work structure on the north-east wall of the custom house at Fanthit, on the east side of the entrance to the river.

Fishing nets may be found at the distance of about 10 miles from the land, abreast Fanthit bay and Viné point.

*General charts 2660a, 1263*





*Kega Pt. Taiku.*

*Tiger I.*

*Peak*

*Mount Guio  
(Nui lon-long).*

*Guio Pt.*

View of coast between Kega and Guio Points, with Mount Guio bearing about  $314^{\circ}$  true, distant 14 miles.

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

**Viné point** is formed by a low hill, steep on its south side, and surmounted by tall trees; it is the south extreme of a peninsula projecting nearly 3 miles from the adjacent coast. There is anchorage in  $3\frac{1}{2}$  fathoms in the bay westward of the point, during the north-east monsoon, opposite a fishing village.

Anchorage can be obtained in the south-west monsoon in the bay on the east side of Viné point, in depths of 3 to 5 fathoms. There is a fishing village at the north end of this bay.

Tiger island (Hon lao) lies close to the east side of Viné point, with a boat passage between; it is not conspicuous from the offing. Viné point is fairly steep-to on its eastern side.

**Guio point** (*Lat.  $11^{\circ} 3' N.$ , Long.  $108^{\circ} 29' E.$* ), situated about 13 miles north-eastward of Viné point, forms the south point of Fanri bay; Mount Guio (Nui hon hong), a sandhill, 853 feet in height, near the coast, nearly 5 miles to the westward, serves to identify it. The bay in which the mount lies has not been sounded, but a rock above water is charted near the shore; the east side of Guio point is fairly steep-to. *See view abreast.*

**Fan ri bay**, between Guio point and Logan point, is about 15 miles wide, with depths gradually decreasing from the offing; its shore is fronted by a bank to about half a mile, increased to nearly a mile off Fan ri village, situated at the mouth of the Luong river.

From Guio point the coast to Fan ri is formed of cliffs of a reddish colour, but to the northward it is sloping and wooded.

A vessel may anchor in a depth of from 4 to 5 fathoms about 2 miles south-west of the mouth of Luong river, with Point Logan bearing  $75^{\circ}$  true; the bar of the river has but about 3 feet water, and is only navigable by boats. Fan ri is a fishing village, the boats from which are seen in the offing, sometimes at a considerable distance from the shore.

Between Fan ri and Logan point is a rocky point, with the village of Cho ginong close west of it.

**Point Logan** is a narrow low neck of land, projecting a mile southward of the adjacent coast, with a ledge with less than 3 fathoms extending  $1\frac{1}{2}$  miles south-west from the point.

A shoal, about a mile in extent, with  $4\frac{1}{2}$  fathoms water, lies  $1\frac{1}{2}$  miles south-eastward of the extreme of the ledge, with the south extreme of Point Logan  $351^{\circ}$  true about 2 miles; it is possibly the prolongation of the shoal off the point.

On the west side of the point there is a bay with a fishing village; this bay affords good anchorage off Point Logan, in about  $3\frac{1}{2}$  fathoms, during the north-east monsoon period. There is also a village

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

north-north-eastward of the point, off which vessels may anchor in a depth of 5 to 6 fathoms in the south-west monsoon.

**Amazon shoal**, one of several patches, with depths of  $4\frac{1}{2}$  to  $4\frac{3}{4}$  fathoms, and 6 to 8 fathoms close around, lies with Point Logan bearing  $309^\circ$  true, distant 4 miles.

**Duchaffaut shoal**, with  $4\frac{1}{2}$  fathoms, lies with Point Logan bearing  $351^\circ$  true, distant  $6\frac{1}{4}$  miles.

The Messageries Maritimes' steamer *Melbourne* reported a depth of  $4\frac{1}{2}$  fathoms about 2 miles  $289^\circ$  true of Duchaffaut shoal, with Point Logan  $0^\circ$  true, distant  $5\frac{1}{4}$  miles. Depths of  $5\frac{1}{2}$  fathoms were found  $1\frac{1}{2}$  miles north-east and three-quarters of a mile west-south-westward of that position. As rocky heads of  $3\frac{3}{4}$  to 5 fathoms, upon banks of sand and coral, have been reported and charted south-eastward of these, the locality should be given a wide berth.

**Althea bank**, with 6 to 8 fathoms, and 3 miles or more in length in a north-east and south-west direction, is charted with its eastern end lying with Point Logan bearing about  $340^\circ$  true, distant 13 miles; it was unsuccessfully searched for by the French ship *Bourayne*, 1878, and its existence is doubtful. All the above dangers are probably on the same bank. A bearing of Cape Padaran, and of its light at night, will keep a vessel southward of these banks.

On and near the above banks are bamboo fishing stakes, at times in considerable depths, which will be avoided by giving Point Logan a berth of about 15 miles.

**Caution.**—The space between Point Logan dangers and Holland bank, Pulo Cecir de Mer, has not been properly surveyed, and caution is necessary when in that locality.

**Pulo Cecir de Terre or Kulao Kau** (*Lat.  $11^\circ 14' N.$ , Long.  $108^\circ 50' E.$* ).—Eastward of Point Logan is a bay about 13 miles wide, in which is situated Pulo Cecir de Terre, a low island, about one mile in length, cliffy on the east and south sides, and having near its centre a mass of rocks higher than the other parts, which is visible at the distance of about 15 miles. The island is rocky and barren, with the exception of a little grass on the flat part.

Rocks above and below water surround the island to a short distance, and there is a patch of 3 fathoms half a mile north of the east end, and another of  $1\frac{3}{4}$  fathoms half a mile south-west of the west end. The island stands on a tongue of the 5-fathoms contour fronting the bay, but about 2 miles  $103^\circ$  true of its north-east point a sounding of  $4\frac{3}{4}$  fathoms is reported as having been obtained.

**Overfalls** are met with from 6 to 12 miles southward of Cecir de Terre, where the depths are irregular, ranging from 8 to 16 fathoms.

*General charts 2660a, 1263.*







*Cape Padaran.*

*Fan rang bay.*

*Table mount.*

*Davaich head,  
bearing 5° true.*

View of coast between Cape Padaran and Davaich Head, with Cape Padaran bearing about 288° true, distant 10 miles.

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

**Breda bank.**—Between Pulo Cecir de Terre and Padaran gap lies Breda bank, with a least known depth of 2 fathoms, coral bottom, with the island bearing 216° true, distant 4 miles; the bank is 1½ miles in extent, with depths under 5 fathoms, and less water than 2 fathoms may exist.

Padaran gap, bearing westward of 351° true, leads eastward of Breda bank.

**The coast.—Aspect.**—The coast between Point Logan and Cape Padaran is backed at a short distance by mountainous land, attaining a height of 3,051 feet westward of Padaran (Kana) gap. Within Point Logan is a range attaining a height of 2,624 feet.

**Padaran (Kana) gap** is situated near the eastern portion of the bay mentioned as being 13 miles wide, and is conspicuous from the south-westward only.

**Kana anchorage.**—Anchorage may be obtained in the north-east monsoon period of the gap, in a depth of 6 to 10 fathoms, sand. Two rocky heads, 22 yards apart, covered at high water, and which only break during bad weather, lie about a third of a mile from the eastern shore, with the south extreme of the land (off which is a rock) bearing 123° true, and the pagoda of the village 348° true.

Rocks above water front the shore on the west side of the gap.

**CAPE PADARAN (Mui Dinh)** (*Lat. 11° 22' N., Long. 109° 1' E.*), is high land, steep and convex to seaward, forming the south-east extreme of the continent. The high land of Cape Padaran extends about 7 miles west-south-westward from the cape, and attains a height about midway of 2,132 feet. Being separated from the Cecir range to the westward by Padaran gap, the land of Cape Padaran has an isolated appearance when approached from the south-west and from the northward. *See view on page abreast.*

**LIGHT.**—From a white lighthouse, 33 feet in height, erected near the east extreme of Cape Padaran, is exhibited at an elevation of 610 feet above high water, an *alternating* light, showing four flashes, *two white and two red, about every twelve seconds, thus:—flash, white eight-tenths of a second; eclipse, two and two-tenths seconds; flash, white, eight-tenths of a second; eclipse, two and two-tenths seconds; flash, red, half a second; eclipse, two and two-tenths seconds; flash, red, half a second; eclipse, two and two-tenths seconds.* It may be visible from a distance of 32 miles in clear weather, but is cut off by the land when bearing eastward of 48° true. The *red* flashes will not be visible so far as the *white* flashes of light.

**Storm signals** are shown here; *see page 32.*

**The current** runs strong to the southward during the north-east monsoon, north-eastward of Cape Padaran. *See page 203.*

*General charts 2660a, 1263.*

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

**Anchorage.**—There is anchorage for large craft in a depth of about 9 fathoms off a small bay close northward of Cape Padaran, in the south-west monsoon period, with the extremity of the cape bearing 157° true; the bottom is foul nearer the shore. Good water may be found within the first ridge of sandhills.

There is small craft anchorage on a sandbank north-eastward of a rock near the beach.

**THE COAST**, from Cape Padaran, takes a general northerly direction to Cape Varella, affording some sheltered anchorages, particularly that of Kam Ranh, and Port Dayot in Van Fong bay.

**FAN RANG BAY** lies between Cape Padaran and East point, 14 miles apart. From Cape Padaran the coast trends northward 11 miles to the mouth of Fan Rang river, where is the town of Mantung; it is fronted by a coral ledge, and is backed by high land a mile within it. The mouth of the Fan Rang is fronted by a coral ledge to the distance of three-quarters of a mile, dry in places at low water, and forms the south entrance point of Navan bay.

**Navan bay** lies between Fan Rang river and East point; on its north shore is the entrance to Navan river, leading to a lagoon. Eastward of the mouth is Haifong bank, extending about three-quarters of a mile from the shore, with rocky heads with less than 3 feet water over them.

Vessels working against the north-east monsoon find good anchorage near the head of Navan bay, in 4 fathoms, good holding ground.

**Buoy.**—A conical mooring buoy, painted white, is moored off the east side of entrance of Navan river, in a depth of 4 fathoms.

**East point** is low, and surrounded by a sandbank, dry at low water.

**Coral patches.—Channel.**—From East point a coral ledge extends  $3\frac{1}{2}$  miles west-south-westward, with shallow heads in places, one, having one foot of water, lies  $1\frac{1}{4}$  miles from the point, and another awash at 3 miles from the point; the ledge extends about a mile westward of the latter patch, with depths of  $3\frac{1}{2}$  to 5 fathoms, and is steep-to. Between it and the reef off Fan Rang is the channel to Navan bay, about a mile in breadth, with depths of 6 to 8 fathoms.

**Light** (*Lat. 11° 35' N., Long. 109° 3' E.*).—On the northern shore, at Khan Hoi, east side of entrance to the Navan river, is exhibited, from a dwelling house, at a height of 17 feet above the ground, at an elevation of 243 feet, a *red fixed* light, with *white sector*, visible from a distance of 11 miles; it shows *white* in the southern channel and *red* over the dangers. For sectors, see Light list and chart.

*General charts 1342, 2660a, and 2661a.*

*Chart 1261, Saigon river to Kam Ranh bay. Var. about 2° E.*

**Directions.**—After passing Cape Padaran, if bound to Navan bay keep about 3 miles from the shore, to give a berth to the reef and foul ground, which extends a mile off-shore for about  $2\frac{1}{2}$  miles northward of the cape; then continue to the northward, with North islet open of East point until Navan peak is approaching the line of the Morne. These objects in line  $321^\circ$  true were used formerly as a leading mark, on which a depth of  $3\frac{1}{2}$  fathoms has been found near the end of the ledge on the east side of the channel before referred to. The peak therefore must be kept open. The house on which the light is exhibited, if it can be distinguished, bearing  $357^\circ$  true, will lead in the fairway of the channel, and to the anchorage off the mouth of Navan river. The church of Fan Rang, on the western side, is a good landmark.

**Anchorage.**—There is anchorage in 4 fathoms off the Custom house (red roof) at the village of Man Rang, north-west corner of Navan bay; also off the entrance to Navan river, southward of the buoy. The river is only accessible to boats,  $1\frac{1}{2}$  feet at low water, but there is a carriage road from Ninh chu, within the entrance, to Fan Rang, about 6 miles distant, the centre of the administration of the province of same name.

**Telegraph.**—**Supplies** of fowls, pigs, and vegetables and fruit are obtainable at Ninh chu; rice is grown extensively in this district. Ninh chu is connected with the telegraph and postal systems. Khan Hoi, a telegraph station, is at the east point of entrance to the river.

The coast railway from Fan Rang to Nhatrang is completed.

**COAST.**—The bight between East point of Fan Rang bay and North islet apparently affords temporary anchorage.

From North islet to Vung Gang bay, about 9 miles to the northward, the coast is mountainous and steep. It has not been surveyed, but the bay is stated to be encumbered with coral patches, and to be unpracticable. On nearing Vung Gang bay the coast becomes abrupt, and the depths are considerable at a few cables distant.

*Plan of Vung Gang bay on 3028.*

**VUNG GANG BAY**, situated to the south-west of Davaich head or False Cape Varela, is difficult to distinguish from seaward, on account of the high mountains which surround it; there are depths of 9 fathoms in the entrance, decreasing gradually to 3 fathoms within a cable of the shore at the head of the bay.

The bay is divided into two basins; the outer affords good protection at all times, and is easy of access. Heavy squalls occur at times, but the holding ground is good. There is a rock above water on the south side at about half a cable northward of Entrance island.

*General charts 1342, 2661a.*

*Plan of Vung gang bay on 3028. Var. about 2° E.*

The inner basin, on the south side of which is the fishing village of Vink Hi, is 4 cables in length by 2 cables in breadth, with depths of 3 to 5 fathoms in the middle portion, which is about a cable in width.

There are a large number of fishing craft here at times in the fine season.

*Plan 3028, Kam Ranh bay.*

**DAVAICH HEAD, or False Varella** (*Lat. 11° 44' N., Long. 109° 13' E.*), the native name of which is Mui Davaich, rises steeply from the sea to a height of 1,014 feet and forms the eastern extreme of a range some 5 miles in length; this range attains a height of 3,114 feet in False Varella summit, on which is an isolated rock or knob resembling that on the true cape. Eastward of the summit is a cone 2,490 feet in height, and some 10 miles within is Table mount, 5,248 feet in height. *See view abreast.*

The cape slopes regularly from the summit, and is wooded to the steep cliffs that front the sea. There is a conspicuous rock 20 feet high close to the south extreme of the head, and a depth of 17 fathoms within half a mile of the head.

**Hon Chut.**—Between the coast and the small bare and rocky island, Hon Chut, 391 feet high, which lies about 3 miles northward of the cape, is a narrow passage, available for junks.

The island is connected with the shore by a ridge with a depth of about 2 fathoms in the centre, but there is a rock awash in the fairway of its southern approach 211° true, distant  $8\frac{3}{4}$  cables from Hon Chut lighthouse, and a patch of  $3\frac{1}{2}$  fathoms 187° true,  $1\frac{3}{10}$  miles from the lighthouse. *See Light, page 213.*

A patch of 5 fathoms lies 55° true  $3\frac{1}{4}$  cables from the lighthouse, with foul ground between it and the shore.

**Milieu**, a small rocky islet, 40 feet high, lies a quarter of a mile from the north-west point of Hon Chut, and from it a spit extends half-way to the island, with a depth of one foot only on its outer edge. Three-quarters of a mile westward of Milieu islet there is a shoal patch, 3 cables in length, with a patch with less than 6 feet water over its eastern end.

There is an islet 50 feet high off its south end, with a rock above water beyond it.

**De la Prise island**, about 2 miles northward of Hon Chut, is 115 feet in height, composed of dark rock, and its summit is covered with scrub and vegetation.

**KAM RANH BAY** (*Camraigne* of the French), between Davaich head, and the south extreme of a peninsula 1,538 feet in

*General charts 1342, 2661a.*



North I

False Varella summit.

False Cape

Kam ranch bay.

Tayne I.

Hone nai.

View of coast from 13 miles south-eastward of Davaich Head (False Cape Varella).



*Plan 3028, Kam Ranh bay. Var. about 2° E.*

height, off which is Tagne island, is one of the finest harbours on the coast of Annam; it is available for all classes of vessels, and offers secure anchorage at all times of the year. The bay is composed of an outer and inner port, the latter being known as the harbour, and surrounded by mountains.

The entrance between Tagne on the north and Hon Chut and De la Prise islands on the south, is about  $1\frac{1}{2}$  miles wide, with depths of 12 to 14 fathoms, and the fairway is free from danger.

**Dangers.**—A patch of  $2\frac{1}{2}$  fathoms, and steep-to, lies half a mile  $30^\circ$  true of Milieu island, north-west of Hon Chut, and a rock awash at low water at 3 cables off the point northward of De la Prise island; and there is also a patch of  $4\frac{3}{4}$  fathoms at half a mile from the south-west extreme of Tagne island, but they are all out of the fairway.

Outer rocks, 8 feet high, lie on the western side of the bay, southward of Kam ranh point.

**Tagne island** is about  $1\frac{1}{2}$  miles in length in a north and south direction, and of the shape of a horseshoe, its coast consisting of large boulders; its summit near the south-west side is 916 feet in height.

The land connecting the two high southern portions of the island is low, with palms growing on it; the east coast, southward of Little Pass, is fronted by coral reef.

There are two rocks, 55 and 100 feet high, on its south-east side, and a small one on its west side, and there is a sunken rock at half a cable west of its north-west extreme.

**Little Pass**, the opening between Tagne island and the northern shore, is but a cable wide, and is further reduced by sunken rocks on both sides; it has a depth of about  $3\frac{1}{2}$  fathoms in the fairway, with rocks on both sides, and should only be used by small craft with local knowledge.

The rock or islet about a mile eastward of Little Pass has a patch of  $1\frac{1}{2}$  fathoms between it and the islet close to the shore, and a patch of  $2\frac{1}{4}$  fathoms at  $1\frac{1}{2}$  cables southward of it.

**LIGHTS** (*Lat.  $11^\circ 47'$  N., Long.  $109^\circ 13'$  E.*).—From a grey masonry tower, 19 feet in height, near the north-east extreme of Hon Chut, is exhibited, at an elevation of 192 feet, a *fixed white* light, visible seaward from a distance of 12 miles in clear weather from  $38^\circ$  true, through north, to  $128^\circ$  true; obscured elsewhere. Increased power between  $308^\circ$  true and  $218^\circ$  true.

On the north-east point of entrance to Kam Ranh harbour, from a grey masonry structure, 4 feet in height, is exhibited, at an elevation of 251 feet, a *fixed white* light, visible about 8 miles from  $323^\circ$  true, through north, to  $233^\circ$  true.

*General charts 1261, 1008, 1342.*



*Chart 3028, Kam Ranh bay. Var. about 2° E.*

A red light is shown at the pier of the French settlement in the harbour.

**Directions.—Anchorage.**—There are no dangers near the fairway of the outer harbour or bay, and there is good anchorage in depths of about 10 fathoms, mud, about a mile north-west of the north-west end of Tagne island; also in the bay on the north side of Tagne in depths of 7 to 8 fathoms, not too near the shoal which extends a quarter of a mile from its head. *See view from the southward, page 212.*

**Kam Ranh harbour,** entered from Kam Ranh bay, is 8 miles in length by about 2 miles in breadth, with depths of 6 to 8 fathoms over a space 3 miles in length by about  $1\frac{1}{4}$  miles in breadth; this latter portion is free from shoals, the known dangers being within the 5-fathoms contour line, and affords good and land-locked anchorage, over mud. The entrance is nearly three-quarters of a mile wide, with depths of 13 fathoms; the point on the east side is bordered by sand, and is fairly steep-to, and has a lighthouse on it, before mentioned; that on the west side, Kam Ranh point, is shallow to the distance of  $1\frac{1}{2}$  cables. Within it lies the Doigt, a hill, 423 feet in height.

**Shoals.—Buoys.**—The south-west head of the harbour is shallow, with less than 3 fathoms to  $1\frac{1}{2}$  miles off-shore, with a sunken rock  $2\frac{1}{2}$  cables within the 3-fathoms edge.

A sand bank, with two rocky heads nearly awash at low water, and about a cable apart, lies  $166^\circ$  true, about 6 cables from South-west rock, west side of the harbour, southward of the railway pier. The bank is marked by four buoys, as charted, namely, red buoy with conical topmark, at south-west extreme; red and white horizontally striped buoy with two cones points together at north-west extreme; black conical buoy, with cylindrical topmark at north-east extreme; and black and white horizontally striped buoy with diamond topmark at the south-east extreme.

A rock, which dries 2 feet, with a rock awash at a cable eastward, lies  $84^\circ$  true,  $1\frac{1}{4}$  miles from the South-west rock. A red buoy with triangular topmark lies eastward of the rock awash.

A patch of  $2\frac{1}{2}$  fathoms lies  $39^\circ$  true, 4 cables from the rock which dries, with a rock which dries 3 feet inshore of it, at the extreme of the coral flat fronting the shore.

On the eastern side, a sandbank projects three-quarters of a mile westward of Sandy point, north extreme of the settlement. A rock with less than 6 feet water lies at its extreme, 7 cables  $276^\circ$  true from the point. For dangers northward to the head of the harbour, *see the plan.*

*General charts 1261, 1008, 1342.*

*Chart 3208, Kam Ranh bay. Var. about 2° E.*

From Verte point, at the north extreme of the harbour, a stream runs northward parallel to the coast for about 12 miles, to a marsh, said to be very unhealthy, separated from the sea by Dgiai beach, a narrow neck of land, consisting of sand hills and a barren, sandy plain. It is of no use for navigation; the banks are covered with fishing stakes.

Some mountains lie about 3 miles within Bangai, the highest of which are La Pelé, 2,425 feet, and the Ass's back, 2,294 feet in height.

**Tides.**—It is high water, full and change, at 8h. 30m.; springs rise 6 feet; generally only one tide in the 24 hours.

**Anchorage.—Directions.**—Vessels can anchor anywhere in the harbour, according to draught, but the best place is on the east side, northward of the entrance, near the coaling establishment, in depths of about 8 fathoms; not too near the shore, as in the event of an on-shore squall or strong breezes there would not be much room to rear cable; the holding ground is good.

The old French vessel of war, *Vaubon*, used as a harbour dépôt for torpedo craft, and two lights are moored on this anchorage.

There is no difficulty in reaching it from sea, the fairway eastward of Hon Chut in the bay or outer harbour being free from danger; the channel is wide and deep between Tagne and De la Prise islands, and the entrance to the harbour has a depth of 13 fathoms, over a breadth of about half a mile. The lights on Hon Chut and on the east side of entrance to the harbour are sufficient guide at night for those acquainted with the place.

**Settlement.—Piers.**—There is a French settlement (Pinghai) on the east side of the harbour, with a Custom house and telegraph station.

It is said to be healthy, and to be free from mosquitoes.

There is a village of 300 Annamese north of the point, employed by the coal firm.

There is a stone pier, 100 yards long, abreast the Coal dépôt, with red light, as before mentioned, and a depth of 20 feet alongside the small cranes at its head. There is another pier northward of it.

The French man-of-war, *Vaubon*, used for a dépôt for torpedo craft, is moored off the Coal dépôt, as above mentioned.

**Mooring buoy.**—A conical mooring buoy lies in the anchorage, bearing 328° true,  $1\frac{3}{10}$  miles from the light on the north-east point of the entrance.

**Bangai.**—On the west side of the harbour is the village of Bangai, at the head of a shallow bay.

A railway pier, about 700 yards in length, has been constructed from the point eastward of Bangai, in a southerly direction, beyond South-west rock. There is apparently a depth of 4 fathoms at its extreme, and small craft can go alongside.

There are two cranes on the pier.

*General charts 1261, 1008, 1342.*

*Chart 3208, Kam Ranh bay. Var. about 2° E.*

**Buoy.**—A black buoy, with cylindrical topmark, marks the 3-fathoms contour, at half a mile westward of the railway pier at Bangai.

**Communication.**—The post and telegraph office is at Bangai.

The cargo boats of the Messageries Maritimes call here. Bangai is connected by the coast railway with Nhatrang to the northward, and Fan Rang to the southward; the portion between Fan Rang and Fan Thit, which will give direct communication with Saigon, will not be completed until about 1914. There is a good road to Saigon.

**Supplies.**—**Coal.**—The coal depôt of Barthélemy and Pourtales on the eastern shore is reported to have in stock about 600 to 700 tons, briquettes from Hongai, and Japanese coal; there are steam launches and coal lighters of about 100 tons. There is also a water tank of about 8 tons. Water is collected in a reservoir and conveyed by pipes to the pier. Beef, fruit, vegetables, fowls, wines, ships' stores, &c., are obtainable.

*Charts 3028, 1008.*

**COAST.**—The east coast of the peninsula forming the east side of Kam ranh bay is mountainous and cliffy, with rocks above water off it in places. It has not yet been surveyed, and should be given a wide berth. The point nearly 2 miles northward of Han nai point is 522 feet in height, rocky and bare. A patch of  $2\frac{1}{2}$  fathoms lies about 2 cables off Han nai point.

Patches of 7 fathoms, steep-to, lies  $353^\circ$  true  $2\frac{4}{10}$  miles, and  $51^\circ$  true  $1\frac{2}{10}$  miles from the 522-foot hill; and others probably exist.

*Chart 1008, Kam Ranh bay to Vung Ro bay.*

**Dgiai beach** commences close northward of the 522-foot hill; it is about 9 miles in length, and terminates at Dong ba point in the southern approach to Nhatrang bay; see view of the coast on chart 1008.

During the south-west monsoon, anchorage can be obtained northward of the 522-foot hill forming the south extreme of Dgiai beach, which is backed by low sand dunes.

**Fisherman islands** are situated from 4 to 6 miles north-eastward of Han nai point. The southernmost Hon Nai, lat.  $12^\circ 0\frac{1}{2}' N.$ , long.  $109^\circ 18\frac{1}{2}' E.$ , a steep, sharp island, is 394 feet high, with a sunken ledge extending nearly a mile north-west of it. The largest Hon Ngai, 361 feet high, has some islets and rocks near its extremes.

**Vulcan rock.**—This sunken danger, with 6 feet water, is situated  $6\frac{1}{2}$  cables north from Hon Nai; there are other shallow spots near it, and depths of 10 to 15 fathoms between it and Hon nai ledge.

**Castlereagh bank** lies in mid-channel, between Hon Ngai and Dgiai beach; the least depth originally reported was  $6\frac{1}{2}$  fathoms, with the summit of Hon Ngai  $100^\circ$  true about  $3\frac{1}{2}$  miles. During an examina-

*General charts 1261, 1342, 1008.*

*Chart 1008, Kam Ranh bay to Vung Ro bay.*

tion by the *Bengali* in 1902 depths of 3 to  $6\frac{1}{2}$  fathoms were found; less water may exist. Position of these depths not given.

**Reefs.**—A coral head, with a least depth of 2 fathoms, at the south end of a reef 2 cables in extent, lies with Hon Ngai summit bearing  $116^\circ$  true about  $4\frac{1}{2}$  miles. A reef about  $4\frac{1}{2}$  cables in extent lies north-westward of the above; the least depth,  $2\frac{1}{2}$  fathoms, lies with Hon Ngai summit  $115^\circ$  true  $5\frac{3}{10}$  miles.

These reefs, which are steep-to, are separated from Castlereagh bank by depths of  $5\frac{1}{2}$  to 10 fathoms. They may generally be distinguished by discoloured water.

The passage inside Fisherman islands is thought to be safe, and to have depths of about 12 fathoms, avoiding Castlereagh bank, but unless acquainted with the locality the prudent mariner will pass seaward of Fisherman isles, until a survey has been made.

**NHATRANG BAY.**—General remarks.—Five islands lie in the southern approach to Nhatrang bay, forming four channels between Lon island (Tré island) the largest, and the mainland, all of which are available. The eastern approach is between Lon and Pyramid islands; and the northern between Pyramid island and Bourayne rock, or between the Grand bank and Tortoise island, in all of which the water is deep.

**LON ISLAND, or Hon Lon** (originally Tré island), is  $6\frac{1}{2}$  miles in length in an east and west direction by about  $2\frac{1}{2}$  miles in breadth. It is formed of three mountainous ridges connected by rather low isthmuses; the eastern is 1,476 feet in height, the centre 1,640 feet, and the western 689 feet. The island is densely wooded and abounds in game; and abundant harvests of swallows' nests are gathered in the fissures of its steep cliffs.

**Villages.**—There is a small village westward of Dam Lia, named Bai Tru, and another upon the tongue of shingle forming the entrance to Dam Chinh. No supplies are obtainable here. In the fishing season numerous fishing stakes encumber the approaches.

**Dangers.**—From the south-east extreme of Lon island, near the lighthouse, a ridge of rocks extends about three-quarters of a mile; one of these, named Nok islet, is 149 feet in height, and 3 cables from the extreme, which is steep-to. See view of the coast on 1008.

About 2 cables off the north-west extreme of Lon island is Black rock, above water; a reef extends about 3 cables west-south-westward from it. Many of the points of the island and its bays are fringed with rocks to the distance of a cable or more in places. All the known dangers will be seen on the chart.

*General charts 1342, 2660a, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay.*

**LIGHT** (Lat.  $12^{\circ} 12' N.$ , Long.  $109^{\circ} 19' E.$ ).—On the south-east extreme of Lon island, from a grey conical tower, 48 feet in height, is exhibited, at an elevation of 336 feet, a *group flashing white light* with a period of *fifteen seconds*, thus:—flash, *three-tenths of a second*; eclipse, *two and seven-tenths seconds*; flash, *three-tenths of a second*; eclipse, *two and seven-tenths seconds*; flash, *three-tenths of a second*; eclipse, *eight and seven-tenths seconds*. It is visible for a distance of 24 miles seaward, between the bearings  $28^{\circ}$  true and  $171^{\circ}$  true.

**Anchorage.**—Two deep bays on the north side of Lon island, named Dam Lia and Dam Tré, afford secure anchorage during the south-west monsoon; and two bays with a common entrance, on the south side of Lon, named Dam Lom and Dam Chinh, afford anchorage during the north-east monsoons.

**Mung island**, nearly a mile southward of Lon island, is 590 feet in height, and apparently volcanic. It is inhabited.

Round rock, 148 feet, lies off its east extreme, and there is a rock with a double head 56 feet north-west of it. There are no outlying dangers.

**Mot island** lies north-west of Mung island, and near the south point of Lon island. It is 328 feet in height and wooded. There are many rocks above water off its north-west and south-east extremes.

**SOUTHERN APPROACH to Nhatrang bay.**—Toan channel, the southern approach to Nhatrang, lies between Dong Ba point and Mung and Mot islands, above described, and on either side of Tam and Mieu islands off the western shore. With the exception of Lion rock, westward of Mot island, there are no hidden dangers.

**Lion rock**, with a depth of 2 fathoms, lies  $3\frac{1}{2}$  cables westward of Mot island; Triple peak open of Nam point, the north-west extreme of Lon island, leads westward of it.

**Dong Ba point**, on the mainland, forms the west side of the southern approach; it is a bold cliff and the eastern termination of a mountainous ridge which separates the district of Kam Ranh from that of Nhatrang. La Tondou peak,  $1\frac{1}{2}$  miles within the point, is 2,198 feet in height, and 3 miles westward is the summit of the range, elevated 3,314 feet, and densely wooded. The high northward of Tondou peak is foul. See view of South entrance on chart 1008.

**Tam island** lies north-eastward of Dong Ba point. It is 328 feet in height, with no definite peak, and is encircled by a narrow reef, steep-to.

**Mieu island**, also 328 feet in height, lies northward of Tam island, and protects Kua Bé anchorage. It has two villages.

*General charts 1342, 2660a, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**Kua Bé.**—Within Mieu island, is Kua Bé, an inlet almost blocked by a sand and mud bank, leaving but a narrow boat channel at low water to Truong Dong, a rather large village within, and distinguished by cocoanut trees and pagodas. Farther in is the village of Binh Tan. Several small streams discharge into Kua Bé, one of which connects with Nhatrang river.

**Kua Bé anchorage** lies between the inlet and Mieu island; it is much frequented by junks calling for the birds' nests collected by the inhabitants of the islands, who are principally Chinese. It is also used by the mail steamers during the north-east monsoon period, the mails being loaded at Kua Bé, and conveyed by train to the Residency at Nhatrang. The Custom-house is near Kua Bé.

NOTE.—There is a channel of the same name, Kua Bé, about 25 miles to the northward, page 225.

**Chut point** is the north point of entrance to Kua Bé. On its summit, 492 feet in height, are the remains of an Annamite fort. From this point the coast is a sandy beach backed by sandhills as far as the entrance to Nhatrang river. The village of Chut is situated at the southern extreme of the beach; here there is a Custom-house. Many junks visit this place in the fine or south-west monsoon period, as for Kua Bé.

**Directions.**—Approaching Nhatrang bay from the southward, a vessel should pass seaward of the Fisherman isles, unless acquainted with the in-shore channel, and enter by either of the channels between the islets into Toan channel, the named portion abreast Nam point; avoiding Lion rock if entering between Mot and Tam islands, the widest channel, by keeping Triple peak open westward of Nam point, east side of Toan channel. Anchor where most desirable, according to the monsoon.

### **NORTHERN APPROACH to Nhatrang bay.— Islands and dangers.—**

**Pyramid or Dune island**,  $3\frac{1}{2}$  miles north-eastward of Lon island, is 754 feet in height, steep-to, and bordered at the base of its cliffs by a narrow ridge of shingle. There is but little vegetation on it. Pyramid island forms a good mark for making Nhatrang bay. See view of the coast on chart 1008.

**Kau island**, 350 feet in height, about one mile north-eastward of the Pyramid, is smaller than that islet, and is destitute of vegetation; it resembles a ruined castle from the offing. Three rocks above water lie off its south extreme and one off its west extreme.

*General charts 1342, 2660a, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**Shala island** (Lat.  $12^{\circ} 22' N.$ , Long.  $109^{\circ} 22' E.$ ), situated about 4 miles northward of Kau island, is 525 feet in height, one mile in length, and rocky. It is destitute of vegetation except for some scrub on its summit, and on which is a conspicuous boulder. About midway between it and Cape Verte is a bank with 8 fathoms water, and with deeper water around it.

**Séche islet**, situated about a mile east-south-eastward of Séche point, is very low, small, rocky, and flat; a rock awash at low water lies 50 yards off its north extreme.

**A rock**, with  $1\frac{1}{2}$  fathoms, formerly charted nearly midway between the islet and Séche point, is from a recent examination (1911) found to have no existence. It was reported by the *Kega* in 1897, but it could not be found by the *Bengali*; it is probable the vessel touched on the rocky ledge extending north-eastward of Séche point.

**Grand bank.—Bourayne rock.**—This bank, situated between Pyramid island and Khe Ga point or Cock's crest, the north point of Nhatrang bay, is nearly  $1\frac{3}{4}$  miles in extent with irregular depths. The shallowest water is on its north-western portion, where there is but 3 feet, named North-west rock. On its south-west portion is Bourayne rock, with 4 feet water, with Pyramid peak bearing  $100^{\circ}$  true, distant  $4\frac{1}{2}$  miles. Irregular depths extend from this rock about half-way to Pyramid island, to avoid which the whole of Bak island should be kept well open of Cape Verte, keeping over towards Pyramid island, which is steep-to. If passing westward of Bourayne rock, keep well over towards Tortoise island.

**Tortoise island**, about half a mile off-shore, southward of Khe Ga point, is rocky, moderately high, and so named from its resemblance to a tortoise. Its eastern side is clear, but to the westward a sandbank extends a considerable distance. Between it and the main is a coral reef which obstructs the channel.

**White rock**, always above water, lies about one mile eastward of the north point of entrance to Nhatrang river; shallow water extends nearly one cable south of it. At half a cable west-north-west of White rock there is a submerged rock with 6 feet water. Between White rock and the shore is Briere island, low and covered with bushes, from which shallow water extends about half-way to White rock. Vessels should keep outside White rock.

**Khe ga point**, or the Cock's crest, the north extreme of Nhatrang bay, is high, wooded, and jagged; the summit within it is about 1,200 feet in height. The bay between it and Nhatrang river is foul to nearly one mile off-shore in its northern portion, and the remainder is fronted by a coral ledge. About midway is a beach about half a mile in extent, affording good landing. Many wood-cutters' huts are situated in this bay.

*General charts 1342, 2660a, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**NHATRANG RIVER and anchorage.**—Nhatrang bay affords good anchorage everywhere during the south-west monsoon period, over sand and mud. A convenient position for vessels of light draught is in a depth of 5 fathoms, abreast the settlement, with the summit of Mot island touching Nam point, the west extreme of Lon island; and the west extreme of Tortoise island in line with White rock. The anchorage south of Chut point is also available.

During the north-east monsoon the anchorages in Toan channel are used, as then there is considerable sea in Nhatrang bay. Landing is easily effected on the beach abreast, or by entering the river.

**The river** has a course of about 70 miles, chiefly through reeded banks, from whence it derives its name, and is navigable for boats and sampans for about 30 miles. About 7 miles from the mouth is Khanh Hoa, the capital of the province; an Annamite viceroy resides there.

The mouth of the river is fronted by rocks, some of which are above water, to the distance of about 3 cables. Between their south extreme and the shore the river discharges over a bar, in the fairway of which are two rocks, only visible at low water springs. Within the entrance points there is a pool with a depth of 8 feet at low water, and vessels of about 8 feet draught make use of it. The tide reaches about half-way to Khanh Hoa.

**Tides.**—There is but one high water daily; its maximum rise is about  $6\frac{1}{2}$  feet, when the moon has its greatest declination; when the moon has no declination the rise is only about  $1\frac{1}{2}$  feet. The time of high water is said to be  $3\frac{1}{2}$  hours after Do Son, or at 8h. 30m. full and change.

The tide tables of the "*Colonies francaises de Mers de Chine*," published annually, state that the tides at Kin Hon are identical with those at Nhatrang.

**Settlement** (*Lat. 12° 16' N., Long. 109° 11' E.*).—The village of Ku Huan is situated on the low and sandy south point of entrance to the river, and is mostly inhabited by fishermen; near it is the French Residency, a small fort and other dwellings in connection with it. Within, on the river bank, is the large village of Xuong Huan, with groups of cocoanut trees. An isolated bluff, surmounted by a pagoda within the village, is conspicuous from the offing, as are also other pagodas in the neighbourhood.

**Supplies.**—Eggs, fowls, vegetables, and fruit are obtainable at Ku Huan, abreast the anchorage off Nhatrang river. Bullocks may be procured through the agency of the Residency there.

**Communication.**—Nhatrang is connected with the telegraph system of Indo-China. Branch mail steamers call twice a month. The railway is in progress from Saigon to it, and the section between Nhatrang and Fan Rang is completed.

*General charts 1342, 2660a, 2661a.*



*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**Winds.—Climate.**—During the south-west monsoon the weather is fine at Nhatrang. Moderate south-east winds prevail, which calm down towards evening and give place to a cool land wind at night.

The months of June, July, and August are nowhere in Tong King as healthy and agreeable with regard to temperature as here. Cyclones are quite exceptional, although their distant effects are observed by a notable change in the appearance of the weather and the state of the sea.

During the north-east monsoon, rain falls in abundance, accompanied at times by a gale. The sea is always heavy and breaks strongly on all coasts exposed to the monsoon.

**BINKANG BAY or Vung Thuk** (*Lat. 12° 20' N., Long. 109° 15' E.*), northward of Nhatrang bay, is a long inlet; the entrance is  $3\frac{1}{2}$  miles wide, with depths of 6 to 10 fathoms, which decrease to 5 and then to 3 fathoms in front of some islets abreast Triple peak. To the north-west of these islets is a marshy basin or inlet, in which there is generally not more than 5 feet of water; it is the estuary of the River Ninh hoa, of growing importance.

The islands and dangers in the approach are mentioned on the preceding pages.

The bay affords good anchorage during both monsoons in depths as requisite.

The peninsula which separates the bays of Binkang and Van Fong is formed of high wooded mountains, the Central summit being 2,788 feet in height; it is separated near Hon Kohe from the mountains of the interior by a low neck.

**Xung bay**, which lies between Séche point and Cape Spec (Mui Kai Sung), is foul, as charted.

A patch which dries, and is steep-to, lies midway between the entrance points. The bluff north-eastward of Séche point is foul to the distance of half a mile.

Vessels proceeding northward from Binkang bay should pass well outside the line joining these points, and within half a mile of the north-west extreme of Shala island, where is the deepest water.

**VAN FONG and BING KOI BAYS.—Aspect.**—Between the mountainous peninsula which forms the north side of Binkang bay and the Hon Gom peninsula, also mountainous, lies Van Fong bay, the main entrance to Bing Koi bay, which is available for all classes of vessels. The peninsula of Hon Gom is connected with the mainland by a low and narrow isthmus 5 miles in length, scarcely half a mile wide in places. On the peninsula are several high and rugged peaks, the most conspicuous of which is Mount Dayot, 2,198 feet in height, and Table mount, 950 feet high, eastward of Dayot; in the southern portion, the Finger and Mount Chauve are also con-

*General charts 1342, 2660a, 2661a.*





*Bak I.*

*Hon Kohe peninsula.*

*Van Fong bay.*

*Kua I.*

*Kua Be,  
bearing 328° true.*

*Guerte I.  
(Dot Mos), bearing  
2° true.*

Approaches to Hon Kohe port, Van Fong bay, and Kua Be, with the latter bearing 328° true, distant about 6 miles.

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

spicuous. On the mainland, about 16 miles from the coast, is a remarkable peak surmounted by two rocks which have the appearance of fingers of unequal size, named Mother and Child; it is 6,890 feet high, and visible in clear weather from a considerable distance.

**VAN FONG BAY** (*Lat. 12° 33' N., Long. 109° 18' E.*) is about 6 miles wide between the mainland and Kua island, with depths of 12 to 15 fathoms, mud. It has no known hidden dangers except a coral shoal  $4\frac{1}{2}$  cables long and 2 cables broad, with a depth of  $1\frac{1}{4}$  fathoms over it, lying  $2\frac{1}{4}$  miles 150° true from Hon Kohe point. There is anchorage under Kua island, in the north-east monsoon period, but it is open to the south-west. *See view of the coast on 1008.*

**Bak and Button islets.**—There are several islets or rocks in the southern approach to Van Fong bay, the outermost of which, named Bak, rocky and bare, is 459 feet high; a rocky ledge, which dries, extends about 20 yards from its east extreme.

About a mile eastward of Bak is Button rock; a rock which dries 3 feet, lies about 160 yards off its north extreme, and its south side is reported to be foul. *See view abreast.*

**Middle and Noire islands.**—Between Bak island and the shore are Long, Middle, and Noire islands; from Middle island a reef extends more than half-way to Long island, which is the north extreme of a peninsula, as charted. Between Middle and Bak islands there are depths of 14 to 16 fathoms apparently, but a rock with two pinnacle heads, covered by 6 feet water, lies about 7 cables 172° true from the southern side of Middle island. A coral patch of small extent, with 4 fathoms, is situated on a line joining the east end of Bak island with Cape Vert, distant nearly 2 miles from the latter. Patches lie between it and the cape, and the shore of the bay for about 2 miles southward of Noire island is foul to the distance of a mile or more.

**Kua island**, on the north-east side of Van Fong bay, is wooded and mountainous, 8 miles in length, and with an average breadth of 2 miles; near its north-west extreme is Mount Passage, a flat peak 1,870 feet high.

An islet lies a little west of its south extreme. North-west of Kua are several islets, the westernmost of which is Comete. *See Dangers, page 224.*

**Passage island**, 65 feet in height, lies nearly a mile off the southern side of the west end of Kua island; it has a rock close off its north end, and a patch of  $4\frac{3}{4}$  fathoms about 3 cables off its west side, with shoaler water between it and the island.

The coast between Cape Vert and Hon Kohe point is reported to be incorrectly shown on the charts. A patch of  $1\frac{1}{4}$  fathoms is charted 150° true  $2\frac{1}{4}$  miles from the latter, with 8 to 9 fathoms around.

*General charts 1342, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**Hon Kohe port**, on the mainland, just within Van Fong bay, is sheltered by the peninsula of the same name, but it is shallow, with depths of less than 3 fathoms  $1\frac{1}{2}$  miles from its head; a patch of  $2\frac{3}{4}$  fathoms lies between the 3 and 5-fathoms lines in the approach. It affords anchorage and shelter for small craft in about  $3\frac{1}{2}$  fathoms, good holding ground. Up the shallow creek at the head of the port is Hon Kohe village.

The importance of the port is the production of salt. Several steamers load here annually from Singapore. There is a Custom-house. Fowls and cattle are obtainable, but water is scarce.

**Tides.**—It is high water, full and change, at about 11h. 30m. The rise of tide is from  $4\frac{1}{2}$  to 6 feet when the moon has its highest declination, and about  $1\frac{1}{2}$  feet when the declination is nothing.

**BING KOI BAY** (*Lat. 12° 42' N., Long. 109° 19' E.*), within Van Fong bay, is 10 miles in length in a north-east and south-west direction, and about 5 miles in breadth, affording anchorage over a space of 5 miles by  $2\frac{1}{2}$  miles, in depths of 6 to 9 fathoms, mud bottom.

Its western shore is fronted by several islands, lying parallel to it, to the distance of about 2 miles, all within the 5-fathoms contour line; the largest is Mamelles island. The head of the bay is shallow nearly out to North islet.

On the shores of the bay are a number of fishing villages, where local products are obtainable; the water is bad.

**Dangers in the entrance.**—A patch of rocks, with a depth of 4 feet, lies  $1\frac{1}{4}$  miles eastward of Mangrove island, west side of entrance, with a patch of  $2\frac{1}{2}$  fathoms at 8 cables eastward, another of  $2\frac{1}{2}$  fathoms at one mile south-east, and a third with  $1\frac{1}{2}$  fathoms at half a mile south of it; and there is a patch which dries one foot at half a mile 280° true of Comete islet, east side of entrance. There are depths of 7 to 9 fathoms between and around these dangers.

**Directions.**—There are two entrances to Bing Koi bay, namely, that from Van Fong bay, which is 4 miles wide, in which are the patches before mentioned, and by Kua Bé, the narrow channel eastward of Kua island, which is deep throughout and seems to require no directions; Lion rock, in the entrance, off the south extreme of Hon Gom peninsula must, however, be given a berth.

To enter from Van Fong bay, the best route is to pass between Comete islet and patch (which dries at low tides) half a mile westward of it, keeping fairly close to the islet; Da Bia peak, situated within Cape Varella (*chart 1342*), kept in line with North islet bearing 22° true, leads in the fairway in about 9 fathoms.

Anchorage may be taken as convenient on that mark or near the peninsula. There are several fishing villages in the bay.

*General charts 1342, 2661a.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

**KUA BĒ** (*Lat. 12° 34' N., Long. 109° 24' E.*) is the channel which separates Kua island from Hon Gom peninsula; it is a third of a mile wide in its narrowest part, with depths of not less than 11 fathoms throughout. Both sides of the channel are formed by high and wall-sided land, and small craft may warp in and fasten to the trees almost anywhere, as it is free from danger within Lion rock. It is the eastern entrance to Bing Koi bay, as before stated. There is an inlet of the same name just south of Nhatrang bay, page 219. See view on page 223.

**Lion rock**, on the east side of the entrance, with 8 feet water, lies about 2 cables 152° true from the south extreme of Hon Gom peninsula, and has depths of 30 fathoms around it.

**Port Dayot** is the name of the bay within Kua Bé, formed in Hon Gom peninsula. It affords perfectly landlocked anchorage in several bays, and is easily entered by Kua Bé, and fairly so through Van Fong bay as for Bingkoi bay. Olivier bay is the most frequented; it has depths of 10 fathoms, and is approached from between Chaigneau and Adran islands.

Lutin bay, northward of Lutin island in the western entrance, has several rocks nearly awash in it, and there is no object in entering it.

**Dangers.**—A reef with one foot water, marked by a stake, and steep-to, lies 255° true, 2½ cables from the north extreme of Adran island; and a coral reef of small extent, with a depth of 5 feet, lies at a distance of 1½ cables 261° true from the same point.

A rock with 5 feet water lies 269° true, distant 2½ cables from the south point of Adran island, marked by a wooden pile; it is situated on a bank about 50 yards long, on which are general depths of 2 to 6 fathoms; the bank is steep-to.

**Supplies.**—There are native villages in the neighbourhood, where fowls, eggs, and fish may be procured.

**COAST.** — **The Three Kings** (*Lat. 12° 34' N., Long. 109° 26½' E.*), about 20 feet high, consist of a group of eight rocks, lying about one mile eastward of the south extreme of Hon Gom peninsula; sunken rocks extend about 2½ cables northward of them. Fortin rock, with 6 feet water, lies 2½ cables north-west of the Three Kings. There is a depth of 20 fathoms or more between these rocks and the coast, but it has not been properly surveyed.

**Doi Moi, or Guerite isle.**—About 5 miles northward of the Three Kings, and close to a point of the mainland, lies the small island

*General charts 1342, 2661a, 1263.*

*Chart 1008, Kam Ranh bay to Vung Ro bay. Var. about 2° E.*

Doi Moi; both the island and point are fringed by sunken ledges, with a channel between, with 11 fathoms water, but it is not recommended; sunken rocks border both sides of it.

**Hon Gom bight**, 3 miles north-westward of Doi Moi, affords good anchorage in a depth of 8 or 10 fathoms, south-eastward of a small island; water is obtainable. The sandy flat, which connects the high land of the peninsula with that southward of Cape Varella, is only half a mile wide in some places, separating the head of Bing Koi bay from the sea as before stated; the islands in that bay may, in passing, be seen over it.

The eastern or seaward side of the sandy flat has apparently not been surveyed.

**Hon Ro** (*Lat. 12° 49½' N., Long. 109° 22' E.*), 360 feet high, an island about half a mile in extent, situated in the approach to Vung Ro, is bordered on its sea face by high perpendicular cliffs, steep-to; on its western side is a shingle beach with a fishing village; its south end is prolonged by a ledge of rocks partly under water, to the distance of one cable.

Vessels anchor between the island and Khanh hoa gia, the beach on the mainland, during the south-west monsoon or fine weather period. The great Mandarin road passes at the back of this beach, and also the telegraph line from Hué to Saigon.

**Vung Ro** lies southward of the high land of Cape Varella, below Da Bia peak, and is formed by the high peninsula extending some 3 miles southward of that cape. It is about 2 miles in length by one mile or more in breadth, with a depth of 10 fathoms at the entrance, decreasing gradually over a clay bottom towards the village at its end; it is free from danger. The land is high all round it.

Vung Ro, formerly a pirate haunt, is one of the safest harbours on this coast, and being near the inshore route up and down the China sea is much resorted to in bad weather by the trading junks. No directions are necessary for entering it.

The tides range from half a foot to 4½ feet, according to moon's declination.

Many fishermen and wood-cutters reside on its shores. Tigers and elephants are, or were, numerous in the forests.

**Water.**—On the west side of the harbour fresh water may be procured in several places, but the best watering place is at the north-west angle of the bay.

*General charts 1342, 2661a, 1263.*





To face page 227.]



*Doi Moi (Guerite)*  
bearing 192° true.

*Mountains of Cape Varella.*

*De Bia Peak.*  
*Lighthouse.*

*Perforated Rock.*  
bearing 314° true.

View of the mountains of Cape Varella, with the lighthouse bearing about 265° true, distant 4 miles.

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 2° E.*

**CAPE VARELLA** (Mui Nai) or Pagoda, the most eastern point of Annam, is formed of steep cliffs, with four rocky peaks, extending nearly north and south for  $3\frac{1}{2}$  miles, having in the middle a small sandy bay, where a stream of good water descends from the mountain into the sea; it is safe to approach, there being depths of from 20 to 25 fathoms at a short distance.

The cape rises sharply to its summit, elevated 2,395 feet above high water, 2 miles within, on which is a conspicuous rock, resembling a pagoda, named Da bia by the natives; it may be seen from a distance of about 50 miles in clear weather, but the summits of the mountains are frequently obscured by clouds or vapours, particularly in the north-east monsoon. *See view abreast; also view B on chart 1342.*

**LIGHT.**—On the point south of Cape Varella, from a white masonry tower, 46 feet in height, and at an elevation of 318 feet above high water, is exhibited a *group-flashing white* light, showing *two short flashes* at intervals of *three seconds* every *twelve seconds*, and visible in clear weather from a distance of 24 miles, between the bearings of 356° true, through west, and 171° true (185°).

**Signal station.—Semaphore.**—A semaphore station has been established just eastward of the lighthouse. Vessels can communicate by the International code both by day and night. Typhoon signals are also shown (page 32). The mast is 85 feet in height, and 243 feet above the sea.

**Anchorage.**—There is anchorage northward of the cape in the south-west monsoon period, about half a mile off a cove, in a depth of about 10 fathoms, with Da Bia summit, bearing 233° true.

There is good fresh water in this cove, and also in the creek southward of the north-east point of the rocks forming the cape.

**Perforated rock.**—About 4 miles northward of Cape Varella lies a mass of rocks, some of them just awash; but the central rock is higher, with a large stone on its summit; in passing near it, when abreast, a hole through will be perceived near the top, which has given it the name of Perforated rock. There are depths of about 18 fathoms between it and the mainland.

**Kua Da Rang** (*Lat. 13° 5' N., Long. 109° 19' E.*).—The coast becomes low northward of Cape Varella; at the first rocky point there are low wooded hills with a village north of it. Thence to Kua Da Rang the coast is formed of low sandhills, with regular depths of 12 to 14 fathoms at about a mile from the shore.

A plain some 30 miles broad extends back to the mountains.

Kua Da Rang enters the sea between Mamelon or Nipple hill to the southward, and a mound, on which are the ruins of a pagoda, to the

*General charts 2661a, 1263.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 2° E.*

northward. Epervier peak lies northward of it. The river flows through the extensive plain at the back, and is accessible to junks, but it has not yet been explored; it is apparently the longest in Annam. Both points of the entrance are foul to some distance, and there are a number of fishing stakes.

The bar had a depth of  $7\frac{1}{2}$  feet at low water in 1904, and presented no difficulty in entering. It is, however, subject to change during on-shore winds. The water from the river discolours the sea at times to some distance.

There is anchorage off the river in about 9 fathoms. The winds are fairly strong on this coast during the greater part of the year.

There is a Custom house and telegraph office at Tui Hoa, within the entrance.

**Coast.**—Northward of Kua Da Rang, as far as Xuan Dai point, a distance of 18 miles, the coast is chiefly low and sandy, interspersed with rocky points and sandhills, and with outlying islets and rocks in places. The plain within is well cultivated. The principal landmarks near Kua Da Rang are Epervier peak, an isolated and sharp hill, 1,312 feet high, at about 2 miles from the coast, and Cone hill, 1,870 feet in height, at about 7 miles north-west of it.

**Bai Ma Lieng islands** (*Lat. 13° 10' N., Long. 109° 18' E.*), two in number, and surrounded by rocks, lie off the first rocky promontory northward of Kua Da Rang. The nearer to the shore is Verte island, 131 feet in height, bare, and a brown colour, except during the rainy season (north-east monsoon), when there is a little verdure. The other is named Coco island. Between these islands is a rocky bank with a rock about 3 feet high. Rocks also extend one cable north-east and westward of Verte island, and southward of Coco island. A reef of rocks covered at high water lies about 3 cables northward of Verte island, and the same distance from the coast.

**Lam Tui**, a thriving village, is situated on the mainland abreast Verte island, surrounded by cocoanut trees.

**Anchorage.**—There is anchorage here for small craft in the south-west monsoon, the fine weather period. The islands afford a certain amount of protection to the anchorage even during the north-east monsoon period, but it is not recommended at that time.

The large fishing village of Chun Bien is situated near the north extreme of the beach between Bai Ma Lieng islands and Bonnet island.

**Bonnet island**, 197 feet in height, is small, black, and rugged in appearance, and connected to the point on the mainland which separates the sandy beaches by a reef.

*General charts 2661a, 1263.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 2° E.*

**The Trapeze** is a black and prominent rocky point between Bonnet island and Mai Nha island. It is 360 feet in height, and fronted by a reef, steep-to, on which the sea breaks at times. The coast northward is composed of low sandhills, interspersed with points of black rock here and there; a few scattered huts may be seen under clumps of cocoanut trees.

**Mai Nha island** (*Lat. 13° 17' N., Long. 109° 18' E.*), 394 feet in height, situated about  $1\frac{1}{2}$  miles from the coast, is wooded, irregular in outline, and resembles the roof of an Annamite house, hence its name. It is inhabited, and also frequented by fishermen from the neighbouring coast. Rocky ledges front the points of the island to some distance.

The channel between the island and the mainland is reduced to 6 cables in width by the ledge from the island, and by the ledge extending  $2\frac{1}{2}$  cables from the main shore, uncovered at about half ebb. During the summer months the channel is blocked by fishing nets.

**Olang lagoon**, on the mainland, between Mai Nha island and Xuan Dai point, is about  $5\frac{1}{2}$  miles in length, and situated at the back of the coast sandhills. Its shores are well cultivated, with rice chiefly, and populous. The southern entrance is a little northward of Mai Nha, and dries about half a foot at low water springs, which will give a depth of about 6 feet at high water springs. Within the bar is a pool with about 7 feet at low water, abreast the village of Tan Kwi. The lagoon is only available for boats; at high water there is a boat channel to Xuan Dai.

The northern entrance is situated in a bend in the coast, southward of the southern extreme of Xuan Dai point, off which there is temporary anchorage for small craft. This entrance, like the southern, has from 6 to 7 feet at high water springs.

**Fu Son**, within the northern entrance to Olang lagoon, is a small harbour with about 2 fathoms at low water, fronting the town of Fu Son. A Chinese colony is formed here in the midst of the Annamites, and there is considerable coasting trade between this port and the ports in Canton province. The numerous pagodas on this coast, and the table-topped hill, 443 feet in height, near Fu Son, render the bay and entrance easily recognisable. The tidal rise is about 6 feet at ordinary springs.

*Plan 3010, Fuyen and Ku mong harbours.*

**Xuan Dai point** (*Lat. 13° 21' N., Long. 109° 16' E.*), the south point of entrance to Fuyen bay, like the rest of the country hereabout, is well cultivated. Its southern extreme is a black and rocky bluff, with a ledge of coral and isolated rocks extending seaward about a

*General charts 2661a, 1263.*

*Plan 3010, Fuyen and Ku mong harbours. Var. about 2° E.*

quarter of a mile. Thence northward towards its extreme detached rocks front the coast, which is moderately high.

**Ilissus rock** (*Lat. 13° 21' N., Long. 109° 17' E.*) is about 250 yards in length and 160 yards in breadth, within a depth of 5 fathoms; the least depth, 5 feet, is at its north-west extreme, from which Xuan Dai point bears 303° true, distant 1½ miles, and is in line with the north peak of Rocheux island. The rock has depths of 12 to 13 fathoms around, and about 11 fathoms between it and the shore.

**Clearing marks.**—The whole of Pulo Gambir seen open of Gain Ba point, bearing 2° true, leads eastward or seaward of the rock. The whole of Rocheux island well open of Xuan Dai point leads northward, and the eastern peak of Cape Varella a little open westward of the west extreme of Mai Nha island, leads between the rock and the shore.

**FUYEN BAY**, also named Dayot, from the name of the province, is the finest in Annam.

The entrance to Fuyen bay is about 2 miles wide, between Xuan Dai point and Vung Chao peninsula, with depths of 9 to 10 fathoms on either side of Île aux Nids. Directions, *see* page 232.

It has several anchorages, the principal of which are Xuan Dai, on the south side of the entrance, the most easily accessible; Vung la on the north side, either available for large vessels according to the monsoon; and Vung Lam, within Xuan Dai. Vung Chao port, the head of Fuyen bay, is available for vessels of moderate draught, affording good and sheltered anchorage over a considerable space in a depth of 4 fathoms, mud, easy of access.

The principal landmarks are the peaks of Vung Chao peninsula, the high and cliffy point Gain Ba, and the high hills around Vung Trikh. *See* view B on 1342.

The country around Fuyen is well cultivated, and on its shores are many landing places for the fishermen. There are numerous villages dotted about, surrounded by cocoanut groves and backed by high ranges of hills forming a magnificent landscape. The province is very prosperous, and its capital is situated in the interior, south-westward of the bay.

**Vung Chao peninsula.**—The southern portion of the peninsula, forming the north-eastern side of Fuyen bay, is a mountainous ridge with three peaks. The southernmost, lower than the others, is conical; the other two are each about 1,181 feet in height. *See* view B on 1342.

Vung la point, the southern termination of the peninsula, is a perpendicular cliff about 230 feet high.

*General charts 1342, 2661a, 1263.*

*Plan 3010, Fuyen and Ku Mong harbour. Var. about 2° E.*

Gain Mong point, about three-quarters of a mile to the north-eastward, has a rock above water about one cable off it. The bight between these points is foul, except at its north extreme. Its sandy shore is divided by a black bluff.

**Gain Ba point** (*Lat. 13° 28' N., Long. 109° 18' E.*) is a peninsula connected to the larger one by a sand isthmus; it has two sharp peaks of nearly equal height, about 656 feet. Rocks, some above water, extend about one cable seaward of the southern peak, with deep water beyond them.

Vessels may find temporary anchorage in the bays on either side of the point, according to the prevailing monsoon, but much obstructed by fishing stakes or nets; in the southern one is a fishing village.

**Islands and dangers.**—*Ile aux Nids* (Nest island) is a small cliffy island situated in the entrance to Fuyen bay, at about one mile north-westward of Xuan Dai point. A reef with  $2\frac{1}{2}$  fathoms, extends a cable from its west side.

**A shoal** of 5 fathoms, with a depth of  $2\frac{1}{2}$  fathoms on its south extreme lies 6 cables 257° true from *Ile aux Nids*.

**Rocheux island**, about half a mile in length, and 174 feet in height, separates Xuan Dai bay from Vung Lam road; it is situated on a ledge fronting the point off which it lies, over which there is only a depth of 3 feet at low water. There is a rock above water close off the north-east extreme of the island.

**Volga rock**, with a least depth of  $2\frac{1}{4}$  fathoms, consists of two rocky heads, 85 yards apart; it lies on the south side of the fairway to Vung Chao port, with the summit of Rocheux island bearing 199° true, distant  $5\frac{1}{2}$  cables; it has depths of  $5\frac{1}{2}$  fathoms around it.

**Bouée rock** barely covers at the highest tides, and is therefore always discernible; it lies on the north side of the fairway abreast and 8 cables north-eastward of Volga rock, with South Vung Nie point bearing 89° true, distant 4 cables.

**Outer anchorages.**—**Xuan Dai** (*Lat. 13° 23' N., Long. 109° 14' E.*) anchorage is convenient during the north-east monsoon, the fine season, and affords anchorage in a depth of 6 fathoms, mud, with the mouth of the river bearing 179° true, and *Ile aux Nids* 61° true, avoiding the  $2\frac{1}{2}$ -fathoms patch westward of *Ile aux Nids* before mentioned, when entering or leaving.

The river at the head of the bay is fronted by a bar with one foot at low water, to the distance of half a mile, with deeper water within; it has several arms, but is only available for boats. Provisions are obtainable at Ba Binh and Kau villages, on either side of the entrance.

*General charts 1342, 2661a, 1263.*

*Plan 3010, Fuyen and Ku Mong harbours. Var. about 2° E.*

**Vung La.**—Anchorage may be taken under Vung La peninsula, north side of Fuyen bay, in from 7 to 8 fathoms, about half a mile south-west of the village of the same name. Small craft can careen in the cove northward of the village, sheltered by an islet; there is anchorage off it in from  $1\frac{1}{2}$  to 3 fathoms.

**Vung Lam road** affords anchorage in a depth of  $4\frac{1}{2}$  fathoms, with Rouge point bearing  $2^\circ$  true, and the north extreme of Rocheux island  $117^\circ$  true; from thence the depths decrease gradually towards the shore. Rocheux island may be rounded at the distance of about 2 cables, or midway between it and Volga rock; the head of the bay is shallow for a considerable distance.

At the village, supplies of provisions are obtainable. There is a Custom house here, and a good road to Song Kau, in Vung Chao port, the chief town of the province.

Ving La bay and islet lie northward of Vung Lam road; the bay is very shallow, adapted for small junks or boats; there is a village on its north shore. A patch of  $2\frac{3}{4}$  fathoms lies a quarter of a mile seaward of the islet, with a fathom deeper water around it. Jaune peak, 440 feet in height, lies southward of this bay.

**VUNG CHAO PORT**, the head of Fuyen bay, is about  $3\frac{1}{2}$  miles in length by about the same in breadth, with an entrance about a mile wide; it has depths of about 4 fathoms over a considerable part of it, and is therefore available for vessels of moderate draught. It may be considered a typhoon anchorage.

**Rouge point** is the west point of entrance to Vung Chao port; a rock with  $2\frac{1}{2}$  fathoms lies  $1\frac{1}{2}$  cables  $160^\circ$  of it, near the 3-fathoms contour line; a rock that dries 5 feet, and therefore nearly always visible, lies on the shore ledge at 80 yards eastward of the point.

**Pluvier reef**, in the centre of the port, is about 4 cables in extent; a rock on the north part of the large part of it dries 4 feet, and other parts from one to 2 feet.

**A reef**, a third of a mile in length, dry from one to 2 feet at low water, lies on the shore flat about from 3 to 5 cables off the north side of approach to Vung Vong village.

Several patches, dry at low water, front the shore northward to the head of the bay.

**Rouge islet**, 85 feet high, lies near the head of the bay; patches which dry lie southward and westward of it, all within the 2-fathoms contour line, as charted.

**Directions.**—The best approach to Fuyen bay and Vung Chao port, having passed Nissus rock by the clearing marks previously given for it, if coming from the southward, is between Ile aux Nids

*General charts 1342, 2661a.*

*Plan 3010, Fuyen and Ku Mong harbour. Var. about 2° E.*

(Nest) and Vung Chao peninsula; thence steering to bring Xuan Dai point in line with the west side of that island, bearing 139° true, which mark astern will lead midway between Volga and Bouée rocks; the latter is almost always visible.

When within these dangers, bring the rock off the north-east end of Rocheux island to bear 174° true astern, which mark leads to the anchorage off the principal village, Song Kau, on the western side of the port, and westward of Pluvier reef, where there is anchorage in about 3 fathoms. The eastern part of the port has better water, 3½ to 4 fathoms.

**Settlements.**—Vung Vong (Chao) (*Lat. 13° 28' N., Long. 109° 16' E.*) is situated on the east side of the port. The principal village is Song Kau on the western shore, through which the main road between Hué and Saigon passes. It is connected with the telegraph system of Inde-China.

**Supplies.**—The branch mail steamers call here bi-monthly, and supplies of provisions can be procured. Water is obtainable near the village in the bay south-west of Vung Vong, and in Vung La creek, and probably at Song Kau.

**Tides.**—The rise of tide in Vung Chao port, at springs (or moon's greatest declination), is about 6½ feet.

**COAST.**—**Vung Trikh.**—From Gain Ba point, the east extreme of the peninsula, northward, the coast forms a sandy bay nearly 3 miles in length, backed by sandhills about 120 feet in height, and a table-topped hill above them highly cultivated. At the north extreme of this bay is a rocky peninsula, similar to Gain Ba, 1½ miles in length and 371 feet in height, the north extreme of which forms the south point of entrance to Ku Mong harbour.

Within Vung Trikh point, the south extreme of this peninsula, is Vung Trikh bay, which affords anchorage in the fine weather season (south-west monsoon) in a depth of from 3 to 5 fathoms, at from 2 to 3 cables off-shore, and temporary anchorage in the north-east monsoon period for small vessels when the wind does not blow in.

The village of Vin Hoa is situated at its head under a group of cocoanut trees. The village of Vung Trikh is situated in the plain to the westward, with Verte hill, 492 feet high, southward of it.

**KU MONG HARBOUR.**—Close northward of Vung Trikh peninsula is the entrance to Ku Mong harbour, both points of which are foul to the distance of a cable. The channel between is very narrow, but is said to have a depth of 8 fathoms; just within it is reduced to 4 and 3 fathoms, mud bottom, affording secure anchorage for small craft. All the western portion of the harbour is shallow.

*General charts 1342, 2661a.*



*Plan 3010, Fuyen and Ku Mong harbour. Var. about 2° E.*

A mark for the fairway of the entrance is Verte hill, a saddle hill, covered with vegetation, situated about  $1\frac{1}{2}$  miles south-westward of Vung Trikh point, bearing  $187^\circ$  true, until well within the entrance points. Thence the fairway course is about  $204^\circ$  true, or for a group of cocoanut trees just visible above the sandhills, anchoring where desirable. There is a depth of  $3\frac{1}{2}$  fathoms in a pool southward of Ku Mong island.

Within and northward of Ku Mong harbour is a large lagoon. The water is fairly deep in places, but it is mostly shallow. Small vessels of about 6 feet draught can enter with local knowledge. Large quantities of salt are obtained from the lagoon, many steamers calling at Ku Mong for it.

**The village** of Ving ho is situated among the cocoanut trees on the north shore of the harbour.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**COAST.—Vung Mong point**,  $2\frac{1}{2}$  miles northward of the entrance to Ku Mong harbour, like that of Gain Ba, has a bay on each side, with a fishing village in the northern one; a vessel intending to anchor there must give a berth to the northern extreme of the point, as rocks project from it above and under water, having 10 fathoms close to them; the anchorage also is in a depth of 10 fathoms.

From Vung Mong point to opposite Hon Dat the coast is steep and mountainous, forming Kambir or Gambir bay.

**PULO GAMBIR, or KAMBIR**, situated about 4 miles north-eastward of Vung Mong point, is narrow, about 2 miles in length, and has two peaks about 360 feet in height, visible about 18 miles in clear weather; there are a few fishermen's huts on the south-west side.

A ridge extends  $2\frac{1}{2}$  cables southward of its south-west point, with a depth of 3 feet on its extreme. Some sharp-peaked rocks, named the Two Paps, lie about a mile south-east of Pulo Gambir.

**LIGHT** (*Lat.  $13^\circ 36'$  N., Long.  $109^\circ 20'$  E.*).—On the summit of the eastern point of Pulo Gambir, a *white group flashing* light, showing groups of *four* quick flashes *every fifteen seconds*, is exhibited from a white conical granite tower, 52 feet high, at an elevation of 387 feet above high water. The light is obscured by the land from the bearing of  $138^\circ$  true to  $103^\circ$  true; it is visible from all other directions ( $325^\circ$ ) in clear weather from a distance of 26 miles.

**Pâques**, a coral bank with 2 fathoms water, lies  $1\frac{1}{2}$  miles from the west side of Pulo Gambir, with the north point of the island

*General charts 1342, 2661a, 1263.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 2° E.*

bearing 30° true, and the Paps in line 112° true. There is a safe passage apparently on either side of this bank.

**Hon Dat**, 243 feet in height, lying about 6 miles north-north-westward of Vung Mong point, and one mile distant from the mainland, is of round form, and covered with trees. Between it and Hon Roi, another round island nearer the shore, there is a passage with a depth of 5 and 6 fathoms, and there are some rocks above water to the northward of the latter island. There is anchorage north-west of Hon Dat in 6 to 8 fathoms.

*Plan 264, Kin Hon or Thi Nai harbour.*

**CAPE SAN HO**, forming the north side of the approach to Kin hon harbour, is a high bluff headland, with patches of  $3\frac{1}{2}$  and  $3\frac{3}{4}$  fathoms, steep-to, at distances of 2 and 3 cables south-west and west of it, as charted. At one mile north-eastward of the cape is Kulao Han, an island connected to the shore by a reef, two other islands lie within its northern end; *see* view on plan.

**KIN HON, or THI NAI HARBOUR**, lies between the high peninsula of Huong Mai, terminating south-eastward in Cape San Ho and the extreme of a neck of sand about  $1\frac{1}{2}$  miles in length, on which is the town of Kin Hon, which has been formed around the village of Gia. It forms a secure anchorage for such vessels as can cross the bar.

**Depths.**—The entrance is half a mile wide between the points, but it is reduced to about a cable by a crescent-shaped spit extending a third of a mile from the west point. It is fronted by a bar at a quarter of a mile seaward of South point, on which there is a depth at low water of 11 feet (1910), and at high water springs about 16 feet, subject to change during heavy freshets or strong winds, and is therefore not to be depended on. The s.s. *Bengali*, in 1903, is reported to have carried 15 feet least depth over the bar at low water, with the west side of K hill (295 feet) bearing 4° true.

Within the bar there are depths of 5 to 6 fathoms over a length of a mile by a quarter of a mile in breadth. Northward of the town the harbour opens out to a shallow lagoon, about 2 miles in length and breadth; several streams discharge into it, one of which communicates with Binh dinh hon, situated about 18 miles to the westward.

**LIGHT** (*Lat.*  $13^{\circ} 45\frac{1}{2}'$  *N.*, *Long.*  $109^{\circ} 13\frac{1}{2}'$  *E.*).—From an iron gibbet. 30 feet high on the wall of a lodge on South point, entrance to Kin hon harbour, a *fixed white* light is exhibited at an elevation of 178 feet above high water, visible at the distance of 7 miles in clear weather. The light is obscured by Huong mai

*General charts 2661a, 1263.*

*Plan 264, Kin Hon, or Thi Nai harbour. Var. about 2° E.*

peninsula, between the bearings of 233° true, through west, and 304° true.

**Buoys.**—Red buoys, with conical topmarks, mark the eastern side of the channel, and black buoys with cylindrical topmarks the west side of the channel; the positions are subject to change; *see* the plan.

**Outer anchorage.—Directions.**—The entrance to the port is easily recognised; *see* view on plan. The state of the bar should be ascertained before attempting to enter. The entrance is between No. 1 black and No. 2 red buoys; the plan is not to be relied on. There are no pilots.

A vessel not intending to go into the harbour may anchor outside the bar in a depth of 4 fathoms, good holding ground, with Cape San ho, the south-east extreme of Huong Mai peninsula, bearing 86° true, and the flagstaff on South point, the east point of entrance, 24° true. This anchorage is not recommended during the north-east monsoon period.

The harbour is subject to a strong downward current in the rainy season which much reduces its security at that time, which is also the typhoon season. The best position then would be well up into the lagoon, away from the narrow entrance.

Loading can only be carried on before noon during the north-east monsoon period, as fresh breezes with considerable sea prevail after that time.

**Railway.**—A railway is under construction from Kin hon to Tourane and Hué; also another line inland to Attopeu.

**Tides.**—The time of high water, full and change, in Kin hon harbour is somewhat irregular; springs rise about  $4\frac{1}{2}$  to  $5\frac{1}{2}$  feet, neaps 2 to  $3\frac{1}{2}$  feet, but *see* tides, page 221.

**SETTLEMENT.—Kin hon.**—The town of Kin hon, formerly the village of Gia, is situated on the spit of the western side of the entrance, and is the residence of the administrator of the province of Binh dinh.

It has a Custom house and other public offices, and is connected with the telegraph system of Indo-China; there is a good road to Binh dinh, the capital of the province. The Messageries Maritime have an agent here, and there are several European and Chinese trading establishments.

**Communication.**—The branch mail steamers of the Messageries line, running weekly between Saigon and Haifong, call here both going and returning.

*General charts 1342, 2661a.*

*Plan 264, Kin Hon or Thi Nai harbour. Var. about 2° E.*

There is a look-out station on the hill eastward of South point, and a battery with flagstaff on South point.

**A jetty** of wood has been constructed on the seaward side of Kin hon, abreast the Post office.

**Trade.—Supplies.**—The population of the port of Kin hon is 3,000, of whom about 20 are French civilians. The chief articles of export are: salt, silk, crapes, beans, sugar, &c. A considerable trade is carried on with Hong Kong, Singapore, Saigon, Haifong, &c., chiefly in the hands of the Chinese.

Merchandise is brought here by small steam craft and junks for shipment from smaller ports in the neighbourhood.

Fresh provisions are cheap, but water is very scarce, and practically not obtainable.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**COAST.**—From Cape San Ho the coast to Vung Bak point,  $8\frac{1}{2}$  miles northward, is steep and high. About  $3\frac{1}{2}$  miles northward of the cape is a remarkable gap between two hills 994 and 554 feet in height. Vung Bak point is rocky and moderately high, with some rocks lying off it.

**Koni islets.—Hon Kan** (Juan Prieto) (*Lat.  $13^{\circ} 53\frac{1}{2}'$  N., Long.  $109^{\circ} 18'$  E.*), 295 feet high, is a steep pyramidal rock, lying  $1\frac{1}{2}$  miles eastward of Vung Bak point; and two miles farther east there are some rocky islets, named Koni or Black Jack islands, about 120 feet high. Vessels may pass between these and Hon Kan, and also within the latter, there being 15 to 20 fathoms water around them. During the south-west monsoon there is good anchorage in the south-west corner of the bay abreast these islets.

**Vung Tang.**—For 5 miles northward of Hon Kan the coast forms a bay backed by sand hillocks to the rocky promontory of Vung Tang, which rises to a height of 2,231 feet at 3 miles within it. This peak, and the one 2,887 feet in height, 4 miles north-westward, have each a single rock on the summit.

On the coast, at 2 miles southward of Vung Tang, is a conspicuous cone, 689 feet in height; to the northward the coast is high and rocky to Nuok Ngot.

**Nuok Ngot**, a prominent headland, 590 feet in height, and steep-to, has several peaks of reddish granite, on the slopes of which are streaks of sand which serve to identify the point. In the bay to the southward is a stream of fresh water, and a village off which vessels can anchor in a depth of 8 to 10 fathoms. Northward of the point is a plain bordered by sand dunes, with isolated hills in places.

*General charts 1342, 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 1° 45' E.*

**Buffalo island** (Hon Tran), 4 miles distant from Nuok Ngot, is a barren granite rock with two peaks, about 98 feet high. Two detached rocks lie about 2 cables east of Buffalo island, with a breaking rock between them and the island. A tide-rip was observed near the west point of Buffalo island, but no bottom was found at a depth of 16 fathoms all around the island. Between it and the shore the depths are said to be regular, from 12 to 14 fathoms.

**Vung Moe**, at 6 miles northward of Nuok Ngot, is a small bay, in which there is a village and a stream where fresh water is obtainable. Within the village are two hills, one of which, 2,198 feet in height, has a round top.

Anchorage can be obtained, in the north-east monsoon, off the village in Vung Moe in a depth of 5 fathoms, sand, at half a mile from the shore.

At 3 miles north of the village of Vung Moe is a rocky point from which the coast, bordered by sandhills, trends north-westward to the mountain, forming An Yo point. Ta Ho lagoon lies within the sandhills.

**Nuok islet** (*Lat. 14° 15' N., Long. 109° 11' E.*).—From Vung Moe the coast trends eastward about one mile to a remarkable cliff, off which are several black rocky islets; the largest, Nuok islet, lies one mile north-east of the cliff, and has two peaks, the eastern being 150 feet high. The channel which separates these islets from the mainland is encumbered with rocks.

During the south-west monsoon there is good anchorage under shelter of the islets, in  $8\frac{1}{2}$  fathoms. It is necessary to pass one mile northward of Nuok islet on account of the rocks which extend from it in that direction.

**Hara** (Tortue) is a small black islet, 33 feet high, lying 6 miles northward of Nuok islet and 4 miles off the sandy coast. A reef extends three-quarters of a cable northward of it.

**An Yo point** is formed by two rocky spurs projecting from a summit, 2,624 feet high, lying to the south-westward. A village lies south of the southern spur, and a little distance off the northern one are sunken rocks, extending about half a cable.

About a mile southward of An Yo point there are two submerged rocks, half a mile off-shore, with a least depth of 2 fathoms and  $3\frac{1}{2}$  fathoms and  $5\frac{1}{2}$  fathoms around; vessels must pass outside.

From An Yo point the coast northward is sandy.

**Laigiang, or Tifu river**, enters the sea in the middle of the sandy coast; there is a village on it surrounded by palms. The anchorage off the river has a depth of 7 to 8 fathoms, sandy bottom. At

*General chart 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about  $1^{\circ} 45'$  E.*  
2 miles west of the river is a hill with a reddish summit and about 11 miles to the northward, north-west of Tam Kwam, is a flat summit, 2,854 feet high.

**Tam Kwam river** (*Lat.  $14^{\circ} 35'$  N., Long.  $109^{\circ} 3'$  E.*) discharges at the northern extremity of the sandy coast, at the foot of a series of hills which terminate in Tam Kwam point; the bar at the entrance is passable only by boats at high water. The anchorage, in 7 fathoms, mud and sand, is partly sheltered from northerly winds by Tam Kwam point, which stretches about one mile eastward from the north side of the entrance, with a shallow spot beyond it.

There is a village on its banks surrounded by plantations of cocoa and areca nuts, where some provisions can be procured. A pagoda, encircled by trees, is situated on a low hill.

**The coast** from Tam Kwam point trends northward 5 miles to Cape Sa Hoi, and presents alternately rocky points and sandy bays; thence northward to Cape Batangan the coast is backed by sand dunes of much the same character; that named Mia, 197 feet in height, over the cape of the same name, at 10 miles from Sa Hoi, and one of 200 feet in height 4 miles southward of the Black rock, and 7 miles southward from the Kwang Ngai river, are the only noticeable ones. There is a rock close under Mia hill, and from the northern (200 feet) sandhill a bank fronts the shore as far as Cape Batangan to about half a mile distance, otherwise the coast is apparently bold to approach. The country is high inland. There is temporary anchorage off the Kwang Ngai river in about 7 fathoms.

*Chart 1005, Ki Kik bay.*

**Cape Batangan** (*Lat.  $15^{\circ} 15'$  N., Long.  $108^{\circ} 54'$  E.*), about 6 miles north-north-east of Kwang Ngai river, is about 65 feet high; rocks above water extend 4 cables from its north side. At  $1\frac{3}{4}$  miles south-eastward of the south extreme of the cape lies Flat rock, showing just above high water; and between this rock and the cape lies Indre rock, with  $2\frac{1}{4}$  fathoms water.

Rocks above water extend about 4 cables off its northern side.

It is recommended to give this cape a berth of a mile.

In the bay northward of the cape there is good anchorage in the south-west monsoon in  $5\frac{1}{2}$  fathoms, with the rocks off the cape bearing  $92^{\circ}$  true. A rock, which dries 3 feet, and surrounded by depths of  $5\frac{1}{2}$  fathoms, is reported (1903) to lie half a mile off the shore in the northern end of this bay, about  $4\frac{1}{2}$  miles  $320^{\circ}$  true from Cape Batangan.

**Cape Bantan.**—The coast from Batangan trends north-westward for 12 miles to Cape Bantan, which is 502 feet in height; there are

*General charts 2661a, 1263.*

*Chart 1005, Ki Kik bay. Var. about  $1^{\circ} 45' E$ .*

several high and salient points between, off which there are said to be depths of 20 to 25 fathoms at a short distance, but the chart is bare of soundings. In the interior are several ranges of mountains; *see* view on chart 1005, and that on page 241.

**KULAO RAI, or Pulo Canton**, about 15 miles eastward of Cape Bantan, is nearly 3 miles in length, east and west, and  $1\frac{1}{4}$  miles in breadth. It is formed of several craters and peaks, appearing isolated when seen from a distance of 25 miles, but has a level aspect when viewed from the southward.

The island is surrounded by a coral reef, which extends a mile from the north-west and south-east points; and to the northward there are overfalls and rocky bottom, extending about 3 miles from it.

North island, which is low and rocky, lies  $2\frac{1}{2}$  miles northward of its west extreme, with deep water between.

The north-east sides of these two islands should not be closely approached on account of the unsurveyed ground; *see* Volta bank below.

The holding ground is rocky and bad everywhere, but temporary anchorage may be taken on the south side of Kulao Rai, as shown on the chart.

**LIGHT** (*Lat.  $15^{\circ} 23\frac{1}{2}' N.$ , Long.  $109^{\circ} 6' E.$* ).—From a grey pyramidal tower, 165 feet high, situated about 2 cables within the north-east point of Kulao Rai, and at an elevation of 172 feet above high water, a *white flashing* light is exhibited showing *one very short flash* every *five seconds*; it is visible in clear weather from a distance of 20 miles between the bearing of  $57^{\circ}$  true, through north, west, and south, to  $107^{\circ}$  true ( $310^{\circ}$ ).

**Villages.**—There are villages on the west and south sides of Kulao Rai, and fresh water is procurable; the island is well cultivated.

The wide channel between Kulao Rai and the mainland is apparently clear with the exception of Volta bank, and has a depth of about 30 fathoms.

**Volta bank**, reported in 1874, with a depth of  $2\frac{1}{4}$  fathoms, coral, is charted  $323^{\circ}$  true  $7\frac{1}{2}$  miles from the north-west extreme of Kulao Rai.

The shoal has been partly examined by the French vessel *Bengali*, who found two heads covered with 8 feet water. It is frequented by fishermen during the south-west monsoon period; with any sea the rocks break heavily.

**Overfalls** over a rocky ridge, with charted depths of 7 to 10 fathoms, and deeper water around, extend eastward of Volta bank.

*General charts 1342, 2661a.*







*Grand Summit.  
Ki Kie.*

*Cone.*

*Ki Kik bay.*

*Cape Bantan,  
bearing 200° true.*

View of Ki Kik bay, with Cape Bantan bearing 200° true, distant about 15 miles.



*Kulao Cham.*

*Round Summit*

*Tien sha peninsula.*

View of Kulao Cham, bearing 285° true, distant about 45 miles.

*Chart 1005, Ki Kik bay. Var. about 1° 45' E.*

**Caution.**—It may be proper to observe that sailing vessels adopting the inner passage to China, during the strength of the south-west monsoon, in June, July, and August, ought not to edge off from the coast of Cochin-China until they pass within sight of Kulao Rai, particularly if the winds are light and baffling. In such case it is advisable to steer well to the northward towards the south part of Hainan, to prevent being driven near the north-west extremity of the Paracels, should a north-westerly storm happen to blow from the Gulf of Tong King, which has been frequently experienced in June and July.

**KI KIK BAY (Vung Kit)**, on the west side of Cape Bantan, close to the foot of high hills, is about 6 miles in length and 3 miles in breadth. A bank with less than 3 fathoms fronts the shore to the distance of 4 or 5 cables, towards which the depths decrease gradually from 12 fathoms at  $2\frac{1}{2}$  miles off. There are some rocks above water on the eastern side of the bay near Inner point, within the 5-fathoms contour line.

The-Kan river, the mouth of which is shallow with several rocky islets in it, discharges into the south-east part of the bay. In the west corner of the bay is the village of Bai ran at the foot of a hill, and off the point to the northward are two rocks above water.

At 12 miles inland is the summit of the range which trends nearly parallel to the coast, being 3,707 feet in height and named Grand Ki Kik. *See view abreast.*

**Anchorage** (*Lat. 16° 25' N., Long. 108° 45' E.*).—During the south-west monsoon, good anchorage can be obtained in the south-east part of the bay. A large vessel should anchor in a depth of about 8 fathoms, south-west of Inner point; a small vessel could anchor nearer the shore in 3 to 4 fathoms, well sheltered. Anchorage can also be taken during the south-west monsoon, off Bai ran village, in 6 fathoms, sand, at three-quarters of a mile from the shore.

Water can be obtained in the creeks, or at the watering place north of Bai ran, but here the coast is steep and rocky.

**Hapoix or Little bay.**—Westward of the north-west extreme of Ki Kik bay there is a shallow bay under Cape Hapoix, into which Hapoix or An hoa river discharges; it is encumbered with several sunken reefs, and is only available for boats or junks. A sunken ledge extends about a mile north-westward of Cape Hapoix, at which distance it breaks occasionally. There is a patch of  $4\frac{1}{2}$  fathoms half a mile westward of it.

At the mouth of the river, on the west side, is the village of Fu Xuan. This river trends northward parallel to the low sandy coast, from which it is distant 2 miles, for about 30 miles, where it connects with the Fai foh.

*General charts 1342, 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 1° 45' E.*

**The coast** northward of Cape Hapox is apparently free from danger, the depths decreasing gradually towards it; villages occur here and there; in the interior are several high mountain chains.

**Hon Ong.**—About 18 miles northward from Cape Hapox, and 14 miles off the coast, lies Hon Ong, a round island, 656 feet in height, about half a mile in diameter, and steep-to.

*Plan 1010, Kulao Cham.*

**KULAO CHAM** is an island 1,230 feet high, situated 11 miles north-westward from Hon Ong, and about 7 miles from the mouth of the Fai foh river; it is visible from a considerable distance in clear weather, and forms a useful landmark for vessels running between Saigon and Haifong.

It is about 4 miles in length north-north-west and south-south-east, and  $1\frac{3}{4}$  miles in breadth, having some islands adjoining its south-west side, and others between 2 and 4 miles westward from its north-west side. These are charted as South island, South-west island, Middle or Goat, North, and North-west island from their positions with regard to the main island, failing native names. *See the plan.*

The island is inhabited and well cultivated. *See view on plan, view A on chart 1342, and more distant view on page 241.*

**Anchorage** (*Lat. 15° 57' N., Long. 108° 30' E.*).—The east and north coasts are steep, but the bay on the west side affords good shelter during the north-east monsoon, with a convenient watering place, and anchorage in a depth of 4 to  $4\frac{1}{2}$  fathoms, sand and mud, good holding ground, with deeper water outside the line of the points. There is a village at the head of the bay.

**D'Entrecasteaux rock (Ran man)**, situated 8 cables westward of South island, has a least depth of  $1\frac{3}{4}$  fathoms; within the depths of 5 fathoms it is 5 cables in length by 3 cables in breadth, and steep-to around. From the shallow head the west extremes of North and Goat islands are in line, and the south peak of South island bears 81° true, distant  $1\frac{1}{8}$  miles. North-west island, open westward of South-west island, leads westward of the rock.

**The outer anchorage.**—South-east of Goat or Middle island is a bank of sand and mud, a mile in extent in a north-west and south-east direction, with a least-known depth of  $2\frac{1}{2}$  fathoms near its centre, from which South-west island bears 269° true, distant one mile. Small craft may anchor on this bank in 4 to 5 fathoms, well protected during the north-east monsoon. There is anchorage in 9 fathoms, sand and mud, southward of the bank, with the extremes of Kulao Cham bearing 345° true, and 86° true.

*General charts 1342, 2661a.*

*Plan 1010, Kulao Cham. Var. about 1° 45' E.*

**Caution.**—The bottom is irregular between the anchorage and the mainland, depths of  $5\frac{1}{2}$  fathoms being charted in several places, with 10 fathoms around them; there may be less water, as the space has not been properly surveyed.

**Tides.**—The tides are feeble, except during springs, and then there is only one high water in 24 hours, which occurs about 9 a.m., and low water at 10 p.m., with a range of one to 6 feet. The flood runs south-south-westward. The currents are feeble and irregular, that during the south-west monsoon is scarcely felt.

**COAST.**—**Fai foh or Kua Doi river** (*Lat. 15° 53' N., Long. 108° 22' E.*).—The entrance of the Fai foh lies about 8 miles south-west of Kulao Cham, and is about a quarter of a mile in breadth between a low sandy point to the east and a higher point to the west; the masts of the junks at anchor inside are visible from the offing. See sketch on plan 1010.

A shifting bar of sand extends nearly one mile off its entrance, with about 5 feet over it at low water. Vessels should anchor well off the entrance in depths of 8 to 10 fathoms, as the holding ground is bad.

A branch of this river, the Song Thu Bon, connects with Tourane bay via Tourane river; and another branch with Hapoix to the southward.

The river is much frequented by junks, which carry on a considerable trade with places inland, the principal of which is Kuang Nam, the capital of the province.

**Tides.**—The times and heights of high water, are irregular; the flood sets southward in the offing.

**The coast** from the Fai foh is low, trends north-westward, and forms with the peninsula of Tien sha a large bay with a low shore, in the middle of which there stands a mass of marble rock, conspicuous when sailing along the coast. See view A on 1342.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**TIEN SHA PENINSULA.**—**Cape Tourane** is the eastern extreme of Tien sha peninsula that forms the east side of Tourane bay. This peninsula is about 6 miles in length in an east and west direction, and is mountainous, attaining a height of 2,050 and 2,183 feet at its north and south extremes, respectively. The isthmus connecting it with the mainland is low and its eastern side is steep-to. See view A on chart 1342.

Canton rock (page 245) lies off its north extreme, and the point under the lighthouse is foul to a short distance.

*General charts 1342, 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. 1° 45' E.*

**LIGHT** (*Lat. 16° 8' N., Long. 108° 18' E.*).—On the eastern side of Tien sha peninsula, from a white cylindrical masonry tower, 28 feet high, and at an elevation of 518 feet above high water, a group flashing white light is exhibited every ten seconds, showing thus:—flash, four-tenths of a second; eclipse, two and one-tenth seconds; flash, four-tenths of a second; eclipse, seven and one-tenth seconds. The light is visible in clear weather from a distance of 20 miles from the bearing of 323° true, through west and south, to 129° true (194°).

**Signal station.**—There is a signal station on the cape with which vessels can communicate by International code.

**Storm signals** are also shown when necessary. *See page 32.*

**Anchorage.**—There is sheltered anchorage in Lutin bay, south side of the peninsula, in about 6 fathoms, and westward of this in the little bay of Black rock, so named from the rock above water in it; the approach is by the lead. Tourane is easily reached from across the isthmus.

*Plan of Tourane bay on chart 1342.*

**TOURANE BAY**, between Tien sha peninsula and the point within Kulao Han, is  $3\frac{1}{2}$  miles wide in the entrance, with depths of 11 to 12 fathoms, sand and mud. Within the entrance it is 6 miles in length and the same in breadth at its head, towards which the depths gradually decrease. Excepting Canton rock, there are no dangers outside the 5-fathoms line, which at the mouth of the river extends  $1\frac{1}{2}$  miles off, decreasing to half that distance towards the western part of the bay, within which are some patches of 2 fathoms.

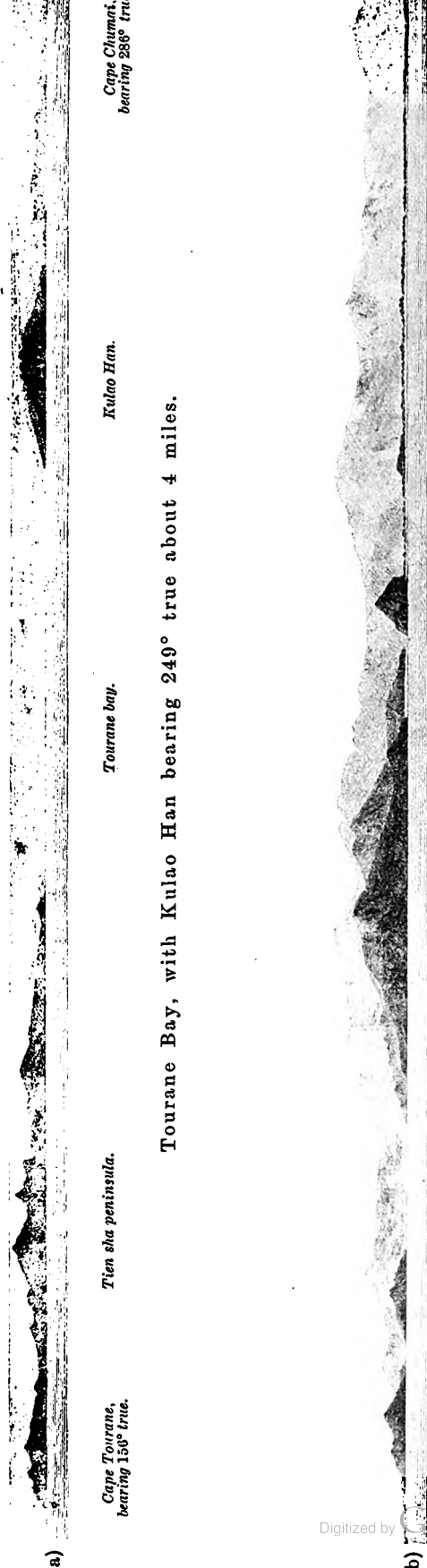
**Aspect.**—The head of the bay is low, but the northern shore is mountainous, attaining a height of 3,970 feet at the Ass's ears some 7 miles within, and about 6 miles west of the Ears is a peak 4,888 feet high; *see view A on 1342, and that on next page.*

The north point of the bay is rocky, and within it are two peaks, the westernmost, Sud des Portes, is 3,904 feet in height and conical in form. Between the two is a fortified pass, 1,870 feet above the sea, through which run the road and railway to Hué.

**Kulao Han**, a cliffy island, about a mile in length, and 853 feet in height, lies on the north side of the entrance to Tourane bay, separated from the point abreast by a channel nearly 4 cables wide, with depths of 13 to 14 fathoms. A patch with 4 feet least water lies on the eastern side of the fairway, about  $1\frac{3}{4}$  cables distant from the south-west side of the island; there are some rocks above water, and a patch of  $2\frac{3}{4}$  fathoms nearer the shore northward of it; the west side

*General charts 1342, 2661a.*





*Cape Tourane,  
bearing 150° true.*

*Tien sha peninsula.*

*Tourane bay.*

*Kulao Han.*

*Cape Chumai,  
bearing 238° true.*

Tourane Bay, with Kulao Han bearing 249° true about 4 miles.

*Kulao Han.*

*Chumai East Cape.*

*Chumai West Cape.*

*Three Summits.*

*Numerous Pagodas along the shore.*

Coast north-westward of Chumai East Cape, with the East Cape bearing 130° true, distant about 7 miles.

*Plan of Tourane bay on 1342. Var. about 1° 45' E.*

of the channel is clear. The island is steep-to on its seaward side. See view *a* abreast.

**Canton rock.**—Canton rock, with two heads, the northern one dry  $1\frac{1}{2}$  feet at low water, and the southern 25 yards south-eastward of it, with  $1\frac{1}{2}$  feet water, lies nearly  $2\frac{1}{2}$  cables off the north extreme of Tien sha peninsula. It is unmarked. Vessels should pass outside the rock. See clearing marks with the directions, below.

**LIGHT.—Observatory light** (*Lat.*  $16^{\circ}7'N.$ , *Long.*  $108^{\circ}13'E.$ ), fixed white, shown from the North fort (ruin) at the east side of Tourane bay, is exhibited, from a white masonry tower, at an elevation of 136 feet above high water. It is visible in clear weather from a distance of 10 miles when bearing from  $210^{\circ}$  true, through south and east, to  $300^{\circ}$  true ( $270^{\circ}$ ).

**Leading marks for anchorage.**—On the beach, about  $1\frac{1}{2}$  miles west of Tourane river entrance, is a white conical stone turret, with triangular topmark, 18 feet high, at an elevation of 49 feet above high water.

A similar turret, with cylindrical topmark, 29 feet high, is situated  $150^{\circ}$  true,  $3\frac{1}{4}$  cables from the above.

**Tides.**—It is high water, full and change, in Tourane bay, at about 9h. 30m.; springs rise 4 feet; there is only one tide in the 24 hours, at springs.

**Directions.—Anchorages.**—The high peninsula of Tien sha and Kulao Han will identify Tourane bay; see sketch A on 1342, and the view *a* abreast. There are no known dangers in the approach, other than Canton rock, off the north shore of the peninsula, and which will be generally visible. Observatory lighthouse, on the North fort, open of the point between it and the rock, or the light in sight at night, leads northward of it.

The best anchorage is in the east part of the bay; vessels of light or moderate draught may anchor about 3 cables southward of Observatory fort, in about 4 fathoms, mud, or mud and shells, with protection from all winds.

Vessels of deep draught must anchor south-west or west of the North fort, in depths of 6 to 8 fathoms, a more exposed position during the north-east monsoon period.

If wishing to anchor off the town, westward of the river, steer in, with the white leading beacons on the shore in line,  $150^{\circ}$  true; bring up according to draught. The depths decrease gradually here.

*Plan of Port Tourane on 1342.*

**Tourane river** is obstructed by a shifting bar which extends about  $1\frac{1}{4}$  miles seaward of the entrance, and it is often impossible to

*General charts 1342, 2661a.*



*Plan of Port Tourane on 1342. Var. about 1° 45' E.*

cross it during the north-east monsoon period. The river is navigable for junks and other small craft to the coal mines at Nang son, 34 miles from the entrance. At 14 miles up the Song Thu bon a branch connects with the Fai foh. The river should only be entered by those acquainted with it.

**Dredged channel.—Buoyage.**—A channel about 50 yards wide, 8 cables in length, and with a least depth of  $7\frac{1}{2}$  feet at low water, has been dredged through the bar into the river. It is marked on the starboard hand, on entering, by red beacons, with triangular top-marks, numbered from 1 to 6, inwards. At night, when the weather permits, small white lights are exhibited from Nos. 1, 3, 4, and 6 beacons. The river should only be entered by those having local knowledge or with a pilot.

The western edge of the bank fronting the river is marked by black beacons, as charted.

**Observatory islet.—Moles.**—Observatory islet is joined to the mainland by a reef of rocks over which a roadway has been built.

Small craft under 8 feet draught can find good shelter between the moles on the north side of the islet.

There are also small piers on the island for coaling and other purposes, with depths of 8 feet alongside.

**Supplies.—Coal.**—The Dock and Coal Company, established on Observatory island afford a plentiful supply of all sorts of provisions from their warehouses, and requisites for shipping, including petrol and coal; about 2,000 tons usually in stock.

Japanese and Nang son coal and briquettes from Hongai are kept in stock on the island.

Tugs and barges convey the coal to vessels in the anchorages.

Coal wharf, 345 feet in length, with 18 feet alongside at low water springs.

Small repairs to machinery are undertaken. Water both drinkable and otherwise is supplied. Mariners are cautioned against using the water from the streams for drinking purposes.

There is a light railway between Observatory island and Tourane.

**The town** (*Lat. 16° 4' N., Long. 108° 12' E.*) of Tourane is situated on the west point of the river entrance, with a river frontage of about 2 miles; it is of some importance from being the outlet from the coal mines of Nang son, 34 miles up river. The town possesses

*General chart 1342.*

*Plan of Port Tourane on 1342. Var. about 1° 45' E.*

many public buildings, including the French Residency, a military hospital, barracks, Custom-house, public offices, and a number of well-appointed business establishments

**Trade.**—The trade is considerable, and several steamers arrive from Hong Kong every month, taking cargoes of sugar, rattans, bamboo, areca nut, silk, cassia, &c.; about a dozen enter the anchorages every month, in addition to a large number of junks.

**Population** about 6,900, of whom about 400 are Europeans.

**Communication.**—The branch vessel of the Messageries Maritimes calls at the anchorage here *en route* from Saigon to Tong King and Hong Kong, weekly, both going and returning. There is a good road to Hué, distant 68 miles. The railway is completed from Tourane to Kwang tri, via Hué, 108½ miles (1910).

A service of Chinese vessels assures regular communication with Hué when the weather permits. There is also boat communication by the lagoons.

**Telegraph.**—Tourane is connected with the Indo-China systems, and by submarine cable with Amoy, China.

**Climate.**—The climate is healthy during the north-east monsoon period, November to March, when fresh breezes prevail. In February squalls from the northward occur, warning of which is given by the clouds collecting on the mountains to the northward. The remainder of the year is hot, and exposure to the sun should be avoided. In April and May the heat is stifling and calms prevail. At this time vessels should anchor well out in the bay away from the high land of the peninsula for the benefit of any light airs that may be experienced there, and to avoid the inshore anchorages which are there unhealthy. In June land and sea breezes prevail. Rain is abundant at all times, especially at the beginning of the north-east monsoon, and it is a rare event if a typhoon is not experienced in the months of September or October.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**The COAST** from Kulao Han, off the north point of Tourane bay, is rocky as far as the mouth of Fu Ya lagoon, marked by a pagoda, a distance of 6 miles, beyond which, to Chumai east cape, it is low.

From Chumai west cape the coast north-westward to Hon Tseu, a distance of about 140 miles, is known to the Annamites as the "iron coast"; it is a low sandy coast with sandhills in places, and backed at a considerable distance inland by high mountains, which are often, particularly in the north-east monsoon season, enveloped in fog. It offers no anchorage during the north-east monsoon period, but in the oppo-

*General charts 1342, 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about  $1^{\circ} 45'$  E.*  
site season vessels may anchor anywhere in suitable depth; there are no known sunken dangers. See view *b*, on page 245.

**Chumai east cape** (*Lat.  $16^{\circ} 21'$  N., Long.  $108^{\circ} 0'$  E.*), situated 12 miles north-westward from Kulao Han, is the extremity of a steep and wooded peninsula, 820 feet high, united to the coast by an isthmus of sand.

**Tua moi bay** lies between Chumai east and west capes; the latter has two peaks, 1,640 and 2,000 feet in height. At the head of the bay is a nearly straight sandy shore, and the village of Chumai, which is visible from the offing; two small rivers discharge at the extremes of this beach, and fresh water can be procured at the eastern one.

Anchorage can be obtained in this bay under the east cape, in a depth of 7 fathoms, good holding ground, but when the north-east monsoon is fairly established it is hardly tenable.

**Truoi lagoon.**—Close westward of Chumai west cape is Tu Hien pass, the mouth of Truoi lagoon, which connects with Hué river, near its mouth, at Thuan An; at low water there is only 3 feet of water on the bar, and there is apparently but little more in the lagoon. West of the entrance are two hills; the one near the shore is 462 feet in height, the other is cone-shaped.

**HUÉ RIVER APPROACH.**—Between Chumai west cape and Hué river the coast is formed of sandhills, on the summits of which are villages surrounded by trees and cultivated fields; a peculiarity which it is said will prevent mistaking this part of the coast for that north of Hué, where the villages are on the sides and not on the summits of the sandhills.

*Plan 264, Hué river entrance; also plan on 1342.*

The position of the river may be identified by Fort Nord, with a flag-staff, situated about  $1\frac{1}{2}$  miles south-eastward of the present newly-formed entrance, and by the beacons for leading over Thuan An bar in the deepest water.

**Anchorage.—Thuan An** (*Lat.  $16^{\circ} 33'$  N., Long.  $107^{\circ} 38'$  E.*).—There is a good anchorage about  $1\frac{1}{2}$  miles  $16^{\circ}$  true from Fort Nord in a depth of about 10 fathoms, sand, but it is very insecure during the north-east monsoon. This anchorage is known as Thuan An, from the name of the settlement that formerly existed about one-third of a mile westward of the fort; see below. There are no dangers in the approach, but the lead should be kept going.

**HUÉ RIVER.—Depths.**—A complete change has recently (1907) occurred in the position of the Hué river approach, the former entrance having completely closed, and a new channel formed in the prolongation of the river; a similar occurrence took place some years

*General charts 1342, 2661b.*

*Plan 264, Hué river entrance; also plan on 1342. Var. about 1° 45' E. ago, when the settlement Thuan An and the hospital were washed away, only Fort Nord remaining.*

Hué river is about one cable wide in the entrance channel, with a depth of about 9 feet at low water, and is fronted by a bar of varying width and extending about a mile seaward, on which there is about the same depth, subject to great and frequent alteration. There is considerable sea on the bar during the north-east monsoon period, causing it to break, and it may be then considered impracticable.

During the south-west monsoon period, vessels of 12 feet draught can probably enter in charge of a pilot; the last of the flood is the proper time to enter. Craft of 5-feet draught can go up to Hué, but the river is much encumbered with sandbanks and fishing stakes. In February the river is at its lowest, and in November at its highest. The stream is strong both on the bar and in the river.

**Tides.**—It is high water, full and change, in Hué river at noon; springs rise from  $1\frac{1}{2}$  to 5 feet, depending on the declination of the moon.

**Pilots.—Bar signals.**—The services of a native pilot can be obtained. He generally boards the craft outside the bar in the fine season (south-west monsoon); the pilots keep the best channel marked with bamboo poles.

The under-mentioned signals are made from Fort Nord flagstaff: Four balls indicate that the bar is in good condition; three balls that it is practicable; two balls that it is practicable with difficulty; one ball that it is dangerous.

**Caution.**—As the bar is constantly changing both in position and depth, no directions can be given for it; craft should not attempt to cross without the aid of a pilot, or recent local knowledge.

**The City of Hué, or Hué Fu** (*Lat. 16° 29' N., Long. 107° 33' E.*), situated about 12 miles from the mouth of the river, is the capital of the kingdom of Annam, and the residence of the king. It is composed of two parts, the inner and the outer town; in the latter the mass of the population resides; the inner town is a large square fortress, built after Vauban, according to the plans of the French engineers. The river encloses it on two sides, besides a canal 130 feet wide, by which it is entirely surrounded.

The principal Europeans are the French Resident, his staff and guard, consisting of 300 French soldiers.

**Population** about 65,000, including 153 Europeans.

**Communication.**—Hué is connected with the telegraph and postal system of Indo-China.

*General charts 1342, 2661b, 1263.*

*Plan 264, Hué river entrance; also plan on 1342. Var. about 1° 45' E.*

The mail steamers of the Messageries call at Tourane (page 247), to which place there is a railway and a good road from Hué. The bar is usually impracticable in the north-east monsoon period.

**Hospital.**—There is a hospital at Hué, with 130 beds.

**Weather.—Climate.**—At Hué the maximum temperature in summer is about 101°, and the minimum during winter 57°.

The rain commences in May, and continues till August, September, or October. The heat during summer is often very trying, and the cold during December, January, and February is very keen, disagreeable, and accompanied by fogs. September, October, and November are mild. The variations of temperature are very sudden.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**COAST.**—The coast north-westward of Hué to Cape Lay, a distance of about 45 miles, is a sandy plain with fishing villages here and there on the coast, as before stated; the only distinguishing marks are the mountains in the interior, some 25 miles distant, the principal of which is Double peak, 5,940 feet in height, often hidden in the clouds or by haze. Midi peak, 2,297 feet in height, lies seaward of it at about 13 miles from the coast, and nearer Cape Lay, about 15 miles from the coast is Cachalot peak, about 2,300 feet in height, with the Tiger's tooth, 4,260 feet in height, about 10 miles within it.

There are no known dangers off the coast, excepting a patch of  $4\frac{3}{4}$  fathoms at  $2\frac{1}{2}$  miles off-shore and 6 miles  $151^\circ$  true from Cape Lay, so that the land can be approached by the lead.

*Plan of Kua Viet on 3542.*

**Palms river, or Kua Viet** (Lat.  $16^\circ 54'$  N., Long.  $107^\circ 11'$  E.) enters the sea at about 13 miles southward of Cape Lay.

The plan shows a depth of about 10 feet on the bar at low water, which extends about 7 cables off, probably subject to change. In 1902, craft of 13 feet could enter during the fine weather (south-west monsoon) period. Its entrance is often marked by breakers.

Within the entrance the river widens and has depths of  $3\frac{1}{2}$  to 5 fathoms up to the pagoda on south side, half a mile from the entrance. Above this it is again barred, and probably only available by boats. It leads to Kuang Tri, chief town of an important province, and from which there is railway communication with Saigon. Hué can be reached in sampans by the inland waterways from this river.

*Plan of Kua Tung on 3542.*

**Kua Tung** enters the sea  $4\frac{1}{2}$  miles southward of Cape Lay. It

*General charts 2661a, 1263.*

*Plan of Kua Tung on 3542. Var. 1° 45' E.*

may be entered at high water during the south-west monsoon period by craft drawing 6 feet water; it breaks at times.

On the north side of the entrance, on a wooded slope, is the sanatorium, a house of European construction, with a village within it. Farther up river is the church of Di Loan, under the Bishopric of Hué; it also forms an excellent landmark. Local supplies are procurable through the missionaries.

*General charts 2661a, 1263.*

## CHAPTER VI.

### TONG KING GULF.

#### CAPE LAY TO CAPE KAMI.

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Variation nearly stationary.

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**GENERAL REMARKS.**—Tong King gulf is the great bight comprised between the parallels of lat. 17° and 22° N., the coast of Tong King on the west and the peninsula of Lei chau and the island of Hainan, on the east. The entrance between Cape Lay and the south-west part of Hainan is about 120 miles wide, which is the general width of the gulf itself. Several islands lie contiguous to the western shore, and numerous small islands and shoals at its head. The depths are from 45 to 40 fathoms in the middle of the gulf, decreasing towards either shore; the bottom is generally soft, and suitable for anchorage.

**Fishing stakes**, consisting of several long poles weighted at the bottom with large stones, are met with occasionally from 25 to 30 miles from the land.

**Vigias.**—On the shores of the gulf and of Hainan island large patches of muddy water resembling banks are seen at times, but on examination deep water is almost invariably obtained.

**Tides.**—The tides on the coast of Tong King are subject to a large diurnal inequality, one high and one low water generally occurring in the 24 hours. At springs the high tide occurs in the evening in the summer and in the morning in winter, with a rise of about 10 feet. On the coast between Hon Tsu and Hon Mé, 80 miles to the northward, the times and heights are similar to those at Hon Mé, Bien Shon and Kua Hoi; or 1h. 30m. earlier than Do Son at springs, and 3 hours earlier at neaps, the times of low water are the same as at Do Son. See Do Son tides, page 273. The tidal wave comes from the southward.

**Weather.**—The north-east monsoon blows strong on this coast, with long periods of calms, and in general the weather is hazy, and the mountains hidden by clouds.

For further information see Chapter I., pages 26, 27, and the Meteorological table, Hanoi, page 564.

*General charts 2861a, 1263.*

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(a)

*Bearing 210° true.*

*Dong Hoi Fort. Great Summit.*

*Bearing 266° true.*

View of the coast from abreast the Great Summit, with Dong Hoi Fort bearing 240° true, distant 10 miles.



(b)

*Cape Vung Chua.*

*Hon Tseu.*

*Hon Chin.*

*Paps.*

Cape Vung Chua to the Paps:—Hon Tseu bearing 250° true about 4 miles.

*Chart 1342, Fan Rang bay to Tong King gulf. Var. about 2° E.*

**CAPE LAY** (*Lat. 17° 5½' N., Long. 107° 6' E.*) is rocky, about 70 to 100 feet high, covered with vegetation, and has a cluster of rocks projecting from it. The south side of the cape is clifty, and in a small creek is a fishing village named Ving Banh. The church of Di Loan, in Kua Trung to the westward, is a good mark for vessels in the neighbourhood, as before mentioned. On the north side of the cape are red and yellow cliffs, and some rocks about half a mile from the shore; west of these cliffs is a large, bare sandhill. Cape Lay is the only rocky projection between Chumai capes and Da Nhai point on the parallel of 17° 40' N., a distance of about 114 miles.

**Tiger island** (*Lat. 17° 9' N., Long. 107° 19' E.*), distant about 13 miles east-north-eastward from Cape Lay, is about a mile in extent, 230 feet in height, and visible in clear weather at a distance of 20 miles. The island is fringed with rocks, principally on its north and west sides, where the ground slopes towards the sea; the south point is clifty, and has a large detached rock. The bottom around the island is rocky and uneven. The channel which separates it from the coast is clear, with from 17 to 23 fathoms water; along the coast, at a distance of about 3 miles, there are depths of 12 to 16 fathoms, blue mud, or mud and sand.

**The COAST** from Cape Lay continues in a north-westerly direction for 37 miles, to Kua Dong Hoi, and is sandy and low, with villages and a few palms in places.

A bank of 8 to 9 fathoms is charted as extending about 4 miles offshore at 9 miles north-westward of Cape Lay.

**Aspect.**—When abreast of Tiger island during fine weather, the whole range of mountains from Double peak, to the south, to the peaks in the neighbourhood of Kua Dong Hoi can be seen. The most conspicuous of the range are a high peak 3,675 feet high, lying 25 miles west-south-westward of Cape Lay, and more to the southward a jagged mountain named Tiger's tooth.

A little southward of the Dong Hoi, the mountains, which are wooded, approach nearer the coast, with several isolated and rugged summits, namely the North and South cones, the Three Summits, and the Nose, 2,362 feet in height; these form an amphitheatre in the neighbourhood of the river. More inland may be seen the jagged peaks of another range, with the Great Summit, flat-topped, and 5,446 feet in height. The mountain chain continues northward of the Dong Hoi, gradually receding from the coast and becoming lower. *See views abreast.*

*Plan of Dong Hoi on 3542.*

**KUA DONG HOI** (*Lat. 17° 30' N., Long. 106° 36' E.*).—This river debouches at 37 miles north-westward of Cape Lay, and the town

*General charts 2661a, 1263.*

*Plan of Dong Hoi on 3542. Var. 1° 45' E.*

of Dong Hoi, chief town of the province of Kuang Binh, is situated on its left or west bank.

The church of Dong Hoi, with two square towers, rises above the sandhills, and is an excellent mark from the offing. On a nearer approach the chapel belfries, on the right bank, and the old fort, on the left bank seaward of it, and the red-roofed houses of the town will be seen. See view *a* from the offing, on page 253.

**Bar.**—The river is fronted by shallow water to the distance of half a mile, and a rocky ledge, partly dry at low water, extends one-third of a mile off the north point.

In 1902 there was a depth of  $10\frac{1}{2}$  feet at low water over the bar, by a winding channel, marked by buoys not to be depended on; the plan shows a patch of 3 feet near the centre. It should not be attempted without local knowledge. Within the bar there are low water depths of about  $2\frac{1}{2}$  fathoms abreast the town, as far up as the church and chapel, between which there is anchorage in about 2 fathoms.

The bar is probably but rarely available during the north-east monsoon season. There is good anchorage off it in the fine weather or south-west monsoon season.

The river is navigable for small craft for about 12 miles, and for boats to the foot of the mountains.

**Town.**—Around the Residency are various public offices. The town is connected with the telegraph system of Indo-China.

**Railway.**—A railway is under construction, which will connect Dong Hoi with Tourane and Kin hon to the southward, and with Hanoi to the northward. See page 247 for portion of line completed to 1910.

*Chart 1342, Fan Rang bay to Tong King gulf.*

**The COAST** from Kua Dong Hoi trends north-westward about 12 miles to Da Nhai point, and is sandy with low cliffs in places; it is backed by sandhills.

**A rock** which dries 6 feet lies 2 miles north of the mouth of Kua Dong Hoi, abreast the first of these cliffs. At 2 miles farther is another cliff of red colour, then a wooded mound, with a pagoda, fronted by a rocky point. The lower slopes of the mountains, and the plain behind this part of the coast, are cultivated, and the summits are wooded.

*Plan of Kua Li Hoa on 3542.*

**KUA LI HOA** (Lat.  $17^{\circ} 38\frac{1}{2}'$  N., Long.  $106^{\circ} 31'$  E.).—At about 10 miles north-westward of Kua Dong Hoi is the mouth of the Li Hoa, with the village of same name on its north point, a centre for the curing of fish.

*General charts 1342, 2661a.*

*Chart 1342, Fan Rang bay to Tong King gulf. Var. 1° 45' E.*

The bar has a depth of about 5 feet at high water, and is not practicable for anything but boats; the fishermen open the channel after the north-east monsoon by dredging.

Within the bar there are low water depths of about 9 feet off the village; the river is shallow above and rocky in places.

**Da Nhai point** (*Lat. 17° 40' N., Long. 106° 29½' E.*), lying one mile northward of Li Hoa, has two rocky points edged with sand; a white pagoda lies at the foot of the northern. The mountains approach the coast here and with the point form a promontory, rendering it easily recognised.

The coast from Da Nhai to Vung Chua is lined with sandhills, and borders a large plain.

*Plan of Song Giang on 3542.*

**Song Giang**, 2 miles northward of Da Nhai point, is fronted by a bar which is steep to to the distance of two-thirds of a mile. Shallow water extends 6 cables off the north point, and about half that distance off the south point, breaking during strong winds. A patch of one fathom lies on the south side of the fairway.

In 1902 there was a depth at high water of 13 feet on the bar, and it presented no difficulty in the south-west monsoon period. It should not be entered, however, without local knowledge, being subject to change. The plan shows buoys, but they are not to be depended on.

There are depths of 4½ to 6 fathoms at the anchorage in the river off the village on the north shore.

Mi Hoa village, on the left bank, was the former residence of the French bishop; fowls, pigs, fish, and other local produce are obtainable. Kuang Khe village, on the right bank, is important as a place where junks are built from trees floated down the river from the mountains inland. The river continues a westerly course, and is fairly deep to the Annamite mountains.

**The coast** from Song Giang to Kua Rone is low and sandy; within is a vast plain, cultivated and inhabited. Marble mount is an isolated peak on the plain, within which are the mountains in the distance.

*Plan of Kua Rone on 3542.*

**KUA RONE** (*Lat. 17° 52' N., Long. 106° 26' E.*) is situated near the north extreme of the sandy shore at about 5 miles south-west of Vung Chua. It may be recognised by a pagoda and some houses. Both points of the entrance are foul, as charted; the channel is only available for junks at high water, and is subject to change. The tidal stream runs strong, but the sea is broken by the north point reef; it is probably only practicable in the fine season.

*General charts 1342, 2661a.*

*Plan of Kua Rone on 3542. Var. 1° 46' E.*

Two villages are situated on the south bank, Kam Giang and Rone; the former is nearer the mouth. It is a centre of a considerable salt industry. The Mandarin road and the telegraph line from Hué to Hanoi, &c., pass through Rone, but there is no telegraph office.

**Outer danger.**—A rocky flat extends 2 miles eastward of Kua Rone, at which distance there is a coral reef, which dries 3 feet at low water; this rocky flat is connected with Hon Tu ut reef, to the northward, all of which should be given a wide berth. (*Chart 1342.*)

*Charts 1342, 2062.*

**CAPE VUNG CHUA** (*Lat 17° 57' N., Long. 106° 29' E.*), easily known by its large red spots, is formed of elevated land, the two wooded summits of which each attain a height of about 3,380 feet at 6 and 10 miles within it; these and other mountain tops inland form excellent marks of recognition. *See view b* on page 253.

**Islets.**—There are two islands near the cape, forming the anchorage of Vung Chua; Hon La, the eastern of these two islands, is 384 feet high; Hon Kau, between it and the cape, is smaller. Between these there is a narrow winding channel, with 5 fathoms water, and a narrow and shallower passage between Hon Kau and the cape.

Hon Tu ut, or Boissieux island, to the south-westward, has two peaks; on its western side is a sunken reef from which a ridge, with from one to 2½ fathoms over it, connects the island with the reef off Kua Rone. Junks find shelter between it and the land, and by an in-shore shallow channel to Kua Rone.

**The anchorage** of Vung Chua, the only place along this coast where protection can be obtained during the north-east monsoon, affords good holding ground, but the swell comes in; the best entrance is southward and westward of Hon La. A small vessel can anchor in a depth of 3 to 5 fathoms, muddy bottom, under shelter of the islands, with the summit of Hon Tseu seen between the cape and Hon Kau, bearing 242° true. Hon Dio should be kept open by vessels of moderate or deep draught. *Le Bourayne* anchored in 10 fathoms, mud, with the Pap south-west of Hon Tu ut, 232° true, and the point west of Hon Kau, 350° true.

There is a fishing village, surrounded by verdure at the head of the bay, which is bordered by a sandy beach. There is a road near the beach to Rone.

**Doubtful shoal.**—A shoal of 10 fathoms, the position and even the existence of which is doubtful, is charted in about lat. 17° 51' N., long. 107° 2' E. It was unsuccessfully searched for by the French vessel of war *Lutin*, in 1888, and is not shown on French charts.

*General chart 1342.*

*Charts 1342, 2062. Var. 1° 45' E.*

**Hon Dio, or South Watcher** (*Lat. 17° 55' N., Long. 106° 39' E.*), situated 9 miles 103° true from Cape Vung Chua, is a rugged rock, 272 feet high, and steep-to; there is a depth of 17 fathoms at less than a cable from its western side, decreasing to 8 or 9 fathoms near the islands off the cape.

**THE COAST** northward from Cape Vung Chua is rocky. One mile north of the point with a pagoda, abreast Hon Kau, is a projecting point, 1,000 feet in height, and about 2 or 3 miles north-west of this are two low points, thence a sandy coast trends north-north-westward 6 miles, to the promontory of Mui Duong, the summit of which is 1,148 feet high. On the sandy coast mentioned are several isolated clumps of trees, and at 3 miles southward of Mui Duong is the village of Eo.

**MUI DONG** (*Lat. 18° 7' N., Long. 106° 25' E.*) is steep-to and rocky, rising to a height of 574 feet immediately over it, and to 1,148 feet, in Vung Han hill, 3½ miles to the south-westward, and is a prominent object. There is but little vegetation on the cape.

**Hon Tseu or Hon Duong**, three-quarters of a mile in length east and west, and wooded, lies 1½ miles south-east of Mui Duong. Seen from the eastward it appears like three pointed hummocks, with a perpendicular cliff towards the north, and sloping to the south-west. Its east and highest peak is 476 feet in height. *See view b on page 253.*

A reef, which partly dries, extends 4 cables from its south-east point; and Hamelin reef, about half a cable wide, with 6 feet least water, and steep-to on its north and south sides, extends 2½ cables west-south-westward from its west extreme.

The channel which separates Hon Tseu from the coast has uneven bottom, and the sea has been seen to break there.

**Anchorage.**—There is good anchorage, in a depth of 6 fathoms, mud, half a mile south of Hon Tseu, which is fairly steep-to. The island and the reef which project from its extremes shelter this anchorage, but in the north-east monsoon the swell would be considerable.

**Hon Chim** (*Lat. 18° 7½' N., Long. 106° 28' E.*), 112 feet high, is a rocky islet, with a number of pointed peaks, lying 1½ miles east-north-eastward of Hon Tseu, with a depth of 10 fathoms between.

**Aspect.**—The coast between Cape Mui Duong and Hon Né, a distance of 120 miles, forms a regular curve, composed in general of sandy plains backed in the interior by high ranges of mountains. These mountains, which touch the coast at Cape Vung Chua, curve westward and thence northward, somewhat similar to the curve of the coast. The most conspicuous peak is Mount Borie, in lat. 18° 10' N., 8,956 feet in height, but being 35 miles from the coast, is from its great elevation

*General charts 2661a, 1263.*

*Charts 1342, 2062. Var. 1° 45' E.*

often obscured. Seen from the northward, it presents a remarkable double summit. There are isolated peaks on the plains near the coast forming good landmarks for vessels in the offing.

**Vung Han bay**, is sheltered from easterly and southerly winds by Mui Duong cape, but is open to those from N.E. to West, and is therefore only available during the south-west monsoon period, but there is some shelter in the north-east monsoon period for very small craft, close under a rocky projection of the cape, on the eastern side of the bay.

Vessels can approach the low and sandy shore at its head according to draught. At the south-west corner of the bay is a large village backed by Vung Han, a conical peak. The country around is mountainous, and seems to be thinly inhabited.

**Kua Kau.**—To the westward, and separated from Vung Han bay by a point from 500 to 650 feet in height, is the Kua Kau, a small river with a bar, which dries at low water. Within is a large lagoon with a village at its head.

**Canal.**—In the Kua Kau is the entrance to the canal which skirts the shore of the gulf as far as the Song Ka river, but it is only navigable for native boats, being dry in certain places at times. It has been proposed to deepen it.

**THE COAST.—Aspect.**—The coast from Vung Han trends north-westward, and is composed of sand occasionally interrupted by isolated mountains, the southernmost of which, named the Paps, in lat. 18° 9' N., long. 106° 16' E., is easily distinguished by its two peaks, 1,444 feet high. A third, but lower peak, lies a little south-east of the others, visible between the bearings of about 204° and 272° true, whence the Annamite name of Rubado, or Three peaks. The two high peaks are in line when bearing 283° true.

A plain extends from the Paps to the foot of the mountains in the interior; it appears well cultivated, and covered with hamlets. Further to the north-west, the coast hills increase in height, and are cliffy to seaward as far as Ru Nuong, a regular cone, 1,492 feet in height, which presents a bold cliff to seaward, and forms a conspicuous landmark for this neighbourhood. *See view b* on page 253.

There are no dangers beyond the 3-fathoms line, excepting the doubtful breaker referred to with Hon Nuong, below. At 2 to 4 miles from the shore are depths of 9 to 13 fathoms, over a bottom of mud and sand.

**Hon Nuong, or North Watcher** (*Lat. 18° 18' N., Long. 106° 9' E.*) is an islet 121 feet in height lying 2½ miles off Ru Nuong cliffs. It is precipitous, and has depths of 8 to 11 fathoms

*General charts 2661a, 1263.*

*Charts 1342, 2062. Var. 1° 45' E.*

around. To the eastward is a ridge of rocks  $1\frac{1}{2}$  cables in extent, east and west, and 26 feet in height; a short distance south-east of them the sea has been seen to break.

**In-shore channel.**—In the channel which separates Hon Nuong from the 5-fathoms line fronting the coast there are depths of 6 to 8 fathoms.

Breakers were reported in 1860,  $148^{\circ}$  true, distant about 2 miles from Hon Nuong; position approximate.

**Kua Nuong**, situated at the foot of the west extreme of Ru Nuong cliffs, has a very narrow entrance blocked by a bar with only a depth of one foot on it at low water. At one mile  $351^{\circ}$  true from this entrance is a group of rocks from 16 to 20 feet high, and about half a mile in extent, with sunken rocks extending a short distance around them; these afford partial shelter to small craft during northerly winds in about 3 fathoms, with the eastern large rock bearing  $13^{\circ}$  true, about 3 cables, and Mount Besson  $280^{\circ}$  true; the holding ground is not good.

A patch of 2 fathoms lies  $58^{\circ}$  true about one mile from the east point of the entrance to the river.

Anchorage may be taken seaward of these dangers in a depth of 5 to 6 fathoms during the south-west monsoon.

On the coast, at 2 miles westward of the entrance, is Mount Besson, 361 feet in height, with a pagoda on its east side; westward of the mount is a hill 167 feet in height.

*Chart 2062, Tong King gulf.*

**Coast.—Mai Shott.**—North-westward of Mount Besson, the coast is low and sandy, without hills, and bare of vegetation, for a distance of 12 miles, to Ru Shott; this mount, 1,273 feet in height, is the summit of a ridge terminating 2 miles to the northward in Mai Shott, which is about 328 feet in height, clifty, and only connected with the mainland by a very narrow isthmus. A rock dries 5 feet in a short distance north of it.

**Kua Shott** (*Lat.  $18^{\circ} 28' N.$ , Long.  $105^{\circ} 54' E.$* ) lies close westward of the high ridge of Ru Shott, between it and the sandy tongue which extends 2 miles south-westward of Kindoy hill, 722 feet in height; a sandy spit dries out from Kindoy village, reducing the entrance to 2 cables or less in width.

There is a depth of 6 feet on the bar at low water; inside the water is deeper, affording shelter for such small craft as can pass the bar; the anchorage is narrow.

There are several large villages on the west bank; one, Kin doy, is a missionary station.

*General charts 2661a, 1263.*



*Chart 2062, Tong King gulf. Var. 1° 45' E.*

**Coast.—Nui Ong.**—Between Kua Shott and Kua Hoi the depths decrease gradually towards the shore, and there are no known sunken dangers.

To the north-west of Kua Shott is Nui Ong, 2,290 feet in height, the most prominent point on this coast, with four peaks of nearly equal height.

**HON MATT** (*Lat. 18° 48' N., Long. 105° 56' E.*), an islet situated 19 miles northward of Kua Shott, and about 10 miles from the coast, is one mile in length, 679 feet in height, and precipitous on all sides except the south; it is a good landmark.

**Rocks.**—At a cable south of its south-east extreme is a rock, awash at low water. A rock, with 6 feet water, and depths of 11 to 12 fathoms around, lies 320° true, distant 1½ miles from the summit of Hon Matt.

**Hon Truan**, 144 feet in height, is the eastern, and highest of the rocks situated 8 cables eastward of the south-east end of Hon Matt.

A small vessel could obtain shelter in the north-east monsoon under Hon Matt in depths of 15 fathoms.

**Islets.**—There are two islets or rocks, between Hon Matt and the Kua Hoi; the southern rock, distant about 7 miles, south-west of Hon Matt, is 39 feet high, with some detached rocks off its west end; the other, at 1¼ miles north-north-west of the southern rock, is low and flat. In the middle of the channel between them and Hon Matt the depth is from 9 to 10 fathoms.

**KUA HOI.—Depths** (*Lat. 18° 45' N., Long. 105° 46' E.*).—The Kua Hoi is considered next in importance only to the Song Ka or Red river of those that discharge into the gulf. It takes its rise in some of the mountains to the southward, but its upper part is so much encumbered with rocks as to be unnavigable.

Vessels able to cross the bar can ascend to Bin Tui, 10 miles up, and the limit practically of navigation.

During high river the French gunboat *Estoc*, of 4½ feet draught, ascended a considerable distance.

The entrance points are both low and sandy; on the southern one is a pagoda, and on the other a small fort. There is a Custom house about 2 miles above the fort.

**The bar**, which is a shifting one, subject to considerable alteration, extends a mile or more seaward of the southern point of the entrance, and may usually be crossed at high water by vessels under 10 feet draught. At exceptionally high tides, during high river, it may be available for vessels of 15 feet draught.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 45' E.*

**Buoyage.—Directions.**—The channel over the bar into the river is subject to frequent and considerable changes; the stakes marking it are shifted, withdrawn, or added to as may be necessary in consequence of any alteration in the passage.

A red spindle buoy, 16 feet in height, is moored in  $4\frac{1}{2}$  fathoms off the entrance; within it the channel is marked by stakes.

Vessels should only enter with local knowledge.

Anchorage may be obtained inside the bar under the fort in 3 to  $3\frac{1}{2}$  fathoms, mud bottom; the tidal stream is very strong here at springs.

At 3 miles above the Custom house, on the western bank, is a creek with a pagoda on its south point, and fronted by a bank. Abreast, near the opposite, or eastern bank, is a rock which dries half a foot, a black conical buoy is placed 60 yards west of it; this is the only danger. There is a straight channel between the buoy and the west bank.

There is anchorage off Bin Tui in about 3 fathoms, avoiding a position off the fort as there is a rock with one fathom water abreast it near the opposite shore.

**Bin Tui** is of some commercial importance; the Mandarin road between Hué and Hanoi passes through it and across the river. It is one hour's walk from Vinh, the capital of the province of Nge An, and situated at the foot of the mountains; the hill over it is surmounted by a fort. It is connected with the telegraph systems.

**HON NIEU.—Anchorage** (*Lat.*  $18^{\circ}48'N.$ , *Long.*  $105^{\circ}45'E.$ )—Hon Nieu, 486 feet in height, at  $2\frac{1}{2}$  miles northward of the Kua Hoi entrance, consists of two hills separated by a neck of low land, so that from a distance, when bearing about  $182^{\circ}$  true, it will appear like two islands. There is good anchorage close under its west end in 5 fathoms, with shelter from north-east winds, much frequented by junks and vessels that cannot enter Kua Hoi. In the passage between the island and coast there is a depth of 3 to 5 fathoms.

**Rocks.**—A rock, which covers at high water springs, lies about  $1\frac{1}{2}$  miles  $24^{\circ}$  true from the north-eastern point of Hon Nieu; breakers also were observed by the *Comete* between this rock and Hon Nieu, about  $13^{\circ}$  true, distant 7 cables from the north-eastern point of the island.

A cluster of rocks, awash at half tide, lies about  $2\frac{1}{2}$  miles  $349^{\circ}$  true of Hon Nieu, and  $100^{\circ}$  true, distant 3 miles, from Cape St. Anne.

Vessels proceeding to Hon Nieu anchorage should pass southward of the island.

**Tides.**—See page 273.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 45' E.*

**COAST.**—**Cape St. Anne** (*Lat. 18° 51' N., Long. 105° 41½' E.*) is clifty, and situated 5 miles northward of the Kua Hoi. The sandy plain through which the Song Hoi flows is terminated by a mountain chain of which Nui Yen, 1,414 feet in height, is the summit, situated about 2½ miles from the coast north-westward of Cape St. Anne.

**Kua Lo** discharges at one mile southward of Cape St. Anne, and is only practicable for native boats. It connects with the Song Hoi at Bin Tui by a canal or creek leading past Vinh, the capital of the province, previously referred to.

**Rocks.**—The north point of the entrance is foul to the distance of nearly a mile, with one or more rocks dry at low water; the south point is foul to about a quarter of a mile. At half a mile southward of the south point is a remarkable high black rock attached to the shore, named Kau Lo rock.

From Cape St. Anne the coast is clifty, and backed by hills for a distance of 5 miles, to Brandon bay, where it is again low.

**Brandon bay**, northward of Cape St. Anne, is about 15 miles wide with depths decreasing gradually towards the shore; the 3-fathoms edge of the bank fronting its head is 2 miles off. The bay affords but little shelter as it is open to the north-east, and during the south-west monsoon the wind blows in at S.E.

The Kua Vann discharges near the centre of the bay, but it is only available for native boats. A considerable number of fishing boats may be seen entering or leaving towards high water, and they will be met with from 10 to 15 miles off-shore during the fine season, also the fishing stakes are met with many miles off-shore.

The mountains are distant from the head of the bay, and there are no landmarks near the coast other than an isolated peak of regular form, named the Pâtè.

**A sunken rock** lies nearly a mile off-shore at about 2 miles south-west of Lakh Kuen entrance, and the shore between is bordered by rocks.

Eastward of the entrance the shore is free from dangers.

*Plan of Lakh Kuen on 875.*

**Lakh Kuen or Mahn son river** (*Lat. 19° 4½' N., Long. 105° 45½' E.*) discharges into the north end of Brandon bay, near Cape Falaise; it is about two cables wide in the entrance, but Kon Cho or Dog rock, situated nearly a cable from the western shore, with which it is connected by a bank, reduces the breadth to one cable. There is a depth of 4½ feet on the bar at low water, which extends about a quarter of a mile seaward of the eastern point of the

*General charts 2661a, 1263.*

*Plan of Lakh Kuen on 875. Var. 1° 45' E.*

entrance, and being somewhat protected from the north-east monsoon by the formation of the coast, is often practicable when the bars of other rivers are not.

An artificial barrier, nearly dry at low water, extends from a little to the north of Dog rock, towards the opposite point of the river, narrowing the channel to about 45 yards.

The anchorage within, abreast Mahn Son, is perfectly sheltered, and has about one fathom least water; the depths increase about half a mile up, to 2 to 4 fathoms in places.

*Chart 2062, Tong King gulf.*

**Cape Falaise**, the north extreme of Brandon bay, is a cliffy point 561 feet in height, with a white stripe on its northern face.

At 4 miles northward of the cape are two conspicuous rocks close to the shore, or about midway in the bay lying between Cape Falaise and Kua Trapp. Hon Tru, the northern, is the higher; rocks front the shore in places.

**Kua Trapp** (*Lat. 19° 13' N., Long. 105° 44' E.*), close westward of Cape Buton, has a large estuary, at the head of which is a village with a pagoda surrounded by trees. At low water the estuary almost dries, but there is a channel on the east side used by fishing boats.

**COAST.—Aspect.**—North of Cape Buton the coast is bordered by a chain of hills attaining a height of 1,430 feet, in Nui Tiep, under which is Bien Shon and the Hon Mé group.

**BIEN SHON ISLAND**, separated from the coast by a channel 3 cables wide, is 2 miles in length north and south, by half a mile in breadth, and 557 feet in height at its north end, decreasing towards the south. There is a remarkable vertical rock nearly detached from its south extreme.

Westward of its north extreme is a bay, which affords anchorage for small craft. It is frequented by Chinese junks in the fine season, but is not tenable during the north-east monsoon period. The depths are said to have decreased, there being only 10 feet on the line joining the points of the bay.

The principal village on the island is situated on the north-west side, and affords supplies of fresh provisions and water.

**LIGHT** (*Lat. 19° 20' N., Long. 105° 47' E.*).—From a white house situated on a hill on the eastern side of Bien Shon bay, a *fixed white* light is exhibited from a white house at an elevation of 82 feet above high water, and 16 feet above the ground, visible at the distance of 9 miles in clear weather, when bearing from 0° true, through west and south, to 90° true (270°).

*General charts 2062, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 45' E.*

**Shoals.**—There is a patch of 2 fathoms distant 4 cables from the east side of Bien Shon, and one mile from its north point.

Extending some distance from the south point of the island is a bank, which breaks, and one-third of a mile southward of the same point is a rock, dry at low water.

**Hien Hoa.**—On the coast abreast Bien Shon is the mouth of the Hien Hoa, which dries.

**Inner channel.**—The channel between Bien Shon and the coast is reduced to less than half a cable in width in places by the bank extending from the mangroves on the mainland. This channel affords shelter for junks and other craft of light draught (from 8 to 13 feet, according to whether it is springs or neaps) entering from the northward. There is a bar with 6 feet water over it, about 4 cables south of the west point of the northern bay of Bien Shon, off which point, at the distance of a cable, is a rock which dries 5 feet, generally marked by a stake. Junk point, nearly under the summit of the island, in line with Finger point, on the south-west side of the island, bearing 165° true, leads in over the bar, having approached this leading mark from the north-eastward with the summit of Hon Mé open of the north point of Bien Shon. Junk point is steep-to. Here small craft may anchor or proceed farther south to abreast the village.

The southern entrance appears to be impracticable.

**HON MÉ** (*Lat. 19° 22' N., Long. 105° 54' E.*).—This group is known by the name of Sapatma by the Chinese, and also by the inhabitants of the coast, who often adopt the Chinese names in preference to the Annamite. They are nearly all precipitous.

Hon Mé, or Van Shon, distant 7 miles from the coast, the most important and northernmost of the group, has several wooded peaks, the westernmost being 773 feet in height. It is fairly steep-to on its north and east sides, with depths of 11 fathoms at a short distance; there is fairly good anchorage on its south-west side, in a depth of 4 to 4½ fathoms, between Hon Vat and Hon Vong; and there is said to be anchorage between Hon Vong or Vang and the south-west coast of Hon Mé, in 8 to 10 fathoms, sheltered from north-east winds.

Hon Bong, the westernmost island, which is flat and precipitous, has rocks extending 4 cables westward of it. A ridge with less than 5 fathoms extends about 7 cables south-west of Hon Gok, situated 3 cables south-east of Hon Bong, and about one mile north-west of Hon Dot; the latter is the highest of these smaller islets, and is cone-shaped. Hon Neu lies about 1½ miles southward of Hon Dot.

Nui Kong peak in line with Cape Bang, leads between Bien Shon and the group, clear of danger.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 30' E.*

**THE COAST** from abreast Bien Shon island trends northward 6 miles to Kua Bang, is composed of sand, and fronted by a bank to the distance of a mile or more. The north point of the entrance, Cape Bang, 295 feet in height, has a peak in the shape of a finger above the sandhills.

**Kua Bang** has a very narrow entrance, and is only accessible to boats. Within are several villages, the most important of which is Lang Diann, a Christian village; the tower of the church is visible over the trees, in the offing.

Northward of Cape Bang is a sandy plain, which continues as far as Cape Kiao. At 3 miles north of Cape Bang, within the 3-fathoms line, are two rocky heads; the outer, at half a mile off-shore, dries 4 feet.

**Aspect.**—A range of hills backs the coast, the southern peak of which is Nui Tu vi, 1,854 feet in height, and cone-shaped; Nui Diaz, 1,696 feet, in lat.  $19^{\circ} 29' N.$ , long.  $105^{\circ} 41' E.$ , is the northern highest peak; these two serve to identify the neighbourhood. At Nui Diaz the range turns abruptly to the west; here the plain of Than Hoa commences, through which run two rivers, the Lakh Yapp and the Song Ma, besides numerous canals.

**Lakh Yapp or Kua Mom** has a depth of 4 feet on its bar at low water springs; vessels of less than 10 feet draught can usually enter at high water, but the banks break on both sides of the passage, which is about a cable in breadth. There is good anchorage within for such craft as can cross the bar in the bend near the south point; farther up a bank nearly bars the river, but there is a channel near the left bank with a depth of 6 to 10 feet. The river turns sharply northward within the bar for about 2 miles, to the foot of Nui Voh hill, which is 426 feet in height and a good landmark, the land all around being low and sandy.

The villages of Ko Kheann and Ko Nian are situated on either side within the entrance.

**Cape Kiao or Nui Gam** (*Lat.  $19^{\circ} 43' N.$ , Long.  $105^{\circ} 52' E.$* ) is somewhat conspicuous, being about 150 feet in height, and with a pagoda on its north side visible from the offing. There is a sandy bight close under it on either side, dry at low water, but affording good landing at high water according to the prevailing monsoon.

**Lakh Kiao or Song Ma** is next in importance to the Kua Hoi of those southward of the delta of the Song Ka. It has two entrances, separated by a bank which breaks at low water. The deepest channel over the bar, which is subject to change, has a depth of about 5 feet at low water at times. In 1903 the minimum depth was 2 feet. About

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 30' E.*

8 miles above the entrance is the town of Than Hoa, which is the chief town of the province, the most important between Hué and Hanoi.

The only conspicuous hill is La Dent, some 15 miles inland, which rises from the plain around. The plain near the coast is cultivated and wooded, with numerous villages scattered about it.

**Beacon and buoys.**—On the north entrance point there is an iron pyramidal beacon, about 30 feet high, painted red, erected to identify the locality, the coast being devoid of landmarks.

In the approach is a black buoy, with cylindrical topmark. The bar is subject to considerable change, and any buoys moored on it are moved as required to mark the channel.

**Lakh Tran** (*Lat. 19° 53' N., Long. 105° 55' E.*).—At about 6 miles northward of Lakh Kiao, is a remarkably steep and isolated hill, 689 feet in height, forming the south side of the entrance to Lakh Tran. The river communicates with Lakh Kiao, in the interior, and is accessible by vessels under 11 feet draught at high water, but is liable to change, like the others on this coast. The entrance is between the high south point and the islet, 88 feet in height, at one cable off it. There is only a boat passage north of the islet.

The points on either side of the entrance are foul to the distance of 50 yards; a rock, with 2 feet water, near the left or north bank is marked by a red buoy, in 6 feet water. In the fairway there is a depth of about 5 feet at low water, and the course in is 341° true, with the summit of an isolated cone hill, 360 feet high, kept midway between the high land and the islet. When abreast the point of the high land haul to 294° true, and gradually 249° true to the anchorage off the village on the south shore, in 9 to 10 feet. There is a rock nearly dry at low water at about 50 yards south of the south point of the anchorage.

This river can be easily entered during the north-east monsoon period, which gives it an advantage over other rivers of greater depth, which are often then not practicable. Without local knowledge a pilot is necessary, the entrance being subject to change.

The village of Truong Xo is on the north shore.

**Outer anchorage.**—There is an islet, 19 feet high, about one mile eastward of the entrance to the river, southward of which there is anchorage in a depth of about 4 fathoms.

**Tides.**—On the coast between Hon Tseu and Hon Né the tides present the same characteristics as those further north, except that the range is about one foot less. The heights and times of the tides are nearly the same along this coast, being from 3h. to 3h. 30m. at full and change, with a rise of about 9 feet, or from 1½ to 2 hours in advance of Do Son (page 273); at neaps the tides are 3 hours earlier than at Do Son.

\* *General charts 2062, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 30' E.*

**Winds.**—Between lat. 18° and 20° N. the north-east monsoon is not so strong as further south, and there are often periods of calm. In general the atmosphere is misty, and the mountains inland are hidden during this monsoon. The south-west monsoon blows along the coast from S.E. or S.S.E.; it is not very fresh as a rule, and does not cause any sea on the bars of the rivers. The mornings are calm, the wind freshens about noon, and continues so until about 4 p.m.; it dies away towards sunset.

**Hon Né**, 282 feet high, lying about 3 miles north-east of the entrance to Lakh Tran, affords a temporary shelter from northerly winds in about 6 fathoms water; it lies off the edge of the shallow water fronting the Kua Dai.

*Chart 1966, Song Ka delta, &c., and chart 2062.*

### **DELTA OF THE SONG KA.—General remarks.**

—About 7 miles northward of Hon Né is the south extreme of a chain of serrated mountains, north-eastward of which the country for a considerable distance inland is entirely flat, forming the delta and the valley of the Song Ka; nothing is to be seen from the offing but a low shore, relieved at a distance by trees which here and there appear to rise out of the sea.

The mouths of the several branches of the Song Ka and the Thai Binh form a great delta between the parallels of lat. 20° N. and 20° 50' N.; and the several branches communicate with each other, partly by natural means and partly by canals.

Fronting the several mouths are extensive shallow banks; the 5-fathoms line in 1897, off the Ba Lakh Dong, being as much as 15 miles south-eastward of the entrance points. On approaching the delta the lead should be constantly used, and none of the mouths should be attempted without a pilot.

**THE SONG KA OR RED RIVER**, which has its source in the centre of the tableland of Yunnan, flows through Hanoi and waters the whole of the valley of Tong King. Its principal tributaries are: On the right bank, the Black river, which also comes from Yunnan, and joins the Song Ka near Hung Hao; on the left, the Bo De or Clear river, which comes from the south-east corner of Yunnan and empties itself into the Song Ka above Song tai. Some miles above Hanoi the main river separates, forming two branches, the southern being named Dai; the northern branch is again divided into several others, of which the principal are the Kua Lakh, the Kua Ha lan, the Kua Ba Lakh Dong, and the Kua Trali. The Song Ka is also joined to the Dai by several canals, two of the principal being the Fu li and the Nam Dinh.

*General charts 2062, 2661a, 1263.*



*Chart 1965, Song Ka delta, &c., and 2062. Var. 1° 30' E.*

Steamers of very light draught run on the Song Ka as far as Laokai, near the Yunnan frontier, and a considerable transit trade is developing. *See* also communication on pages 269, 270.

**Navigable depths.**—Vessels of about 9 feet draught can navigate to Hanoi by the Kua Dai, which has a depth of 10 feet on its bar at high water springs; at low water they cannot get beyond the Fu li canal. The Trali mouth (page 269) is more accessible, but at some distance up it is also barred, there being only water enough for boats. The other mouths are considered impracticable.

From December to May the Song Ka is at its lowest. About May the melting of the snows in Upper Tong King and Yunnan causes the river to rise rapidly, frequently washing away the banks. The rise at Hanoi at high river is from 16 to 20 feet. For the Thai Binh, *see* page 270.

*Chart 2062, Tong King gulf.*

**MOUTHS OF THE SONG KA.**—**Kua Dai route to Hanoi.**—The Kua Dai (*Lat. 19° 55' N., Long. 106° 4½' E.*) is fronted by sandbanks which dry in places from one to 3 feet to the distance of 7½ miles southward of the entrance, or to about the parallel of Hon Né. There is a narrow gutter through these banks, just dry in places at low water springs, which will give a depth of about 10 feet at high water springs.

Immediately within the river there is deep water, and it is possible for a small craft, with the aid of a pilot, to reach Hanoi, either by the Fu li canal or that of Nam Dinh, at high water; as above mentioned.

**Tides.**—The time and rise of tide is about the same as at Do Son, *see* page 273. The tides are felt some miles above Hanoi.

**Buoyage.**—A black spindle buoy, with cylindrical topmark, No. 1, is moored in 3¼ fathoms water (1911), off the bar, at about 8½ miles 189° true from the mouth of the river, with Hon Né bearing 276° true about 5½ miles. The channel within the bar is marked by three red conical buoys, numbered 2, 4, and 6; between No. 1 black and No. 2 red the channel is marked by bamboos. The bar is gradually extending seawards, and the passage over it is subject to frequent changes; the buoys are shifted as necessary.

Hon Né is a good mark when approaching the bar.

North-eastward of the mouth of the Dai and 5 miles off-shore, the *Duchaffaut*, 1878, touched on a bank of soft mud, dry at low water, as charted. Immediately before touching the bank a depth of 9½ fathoms was obtained. It is probably the edge of the shore bank.

*Chart 1965, Song Ka delta, &c.*

**Kua Lakh and Kua Ba Lakh Dong.**—These two mouths are considered to be impracticable for vessels; shallow banks, which break, extend many miles to seaward, the 5-fathoms line (1897) being 14 miles off the mouth of the latter, as charted.

*General charts 2062, 2661a, 1963.*

*Chart 1965, Song Ka delta. Var. 1° 30' E.*

**Kua Trali** is considered as the easiest of access of the mouths of the Song Ka ; but unfortunately in proceeding towards the main branch of the Song Ka, it becomes so shoal that even junks are obliged to stop and transport their cargoes in sampans. An active trade in salt and rice is carried on.

**Kua Dien ho**, situated 5 miles northward of the Trali, is considered impracticable.

**HANOI** (*Lat. 21° 2' N., Long. 105° 50' E.*), the capital of Tong King and the seat of government of Indo-China, is situated on the Song Ka at about 100 miles from its mouths. The fortified towns of Nam Dinh and Hung Yen are situated 30 and 50 miles, respectively, from the entrances.

The city of Hanoi is built close to the river, which here is one-third of a mile in width, and owing to the lakes and trees interspersed, presents a rather picturesque appearance. The citadel occupies the highest site, and is surrounded by a brick wall 12 feet high and a moat. It contains the barracks, arsenals, magazines, &c., and the Royal Pagoda stands within its enclosure. The ancient city is situated between the citadel and the river.

Since the occupation by the French in 1882, great improvements have been effected in the laying out of the town and the formation of roads and streets. Long wide streets have been constructed and lighted by electricity. The cathedral, with three towers, is a conspicuous object. The Petit Lac is a sheet of water in the middle of the new city, near which are the town hall, treasury, post office, &c. Of the temples that of the Grand Bhudda, on the shore of the Grand Lac, is, perhaps, the most important.

The residence of the Governor-General and Commander of the troops, the Government offices, hospital, &c., are situated on what was formerly the Concession, near to the river bank.

**Population.**—The population of Hanoi last census was 61,486, of whom about 2,727 were Europeans (exclusive of the military); including suburbs the population is apparently about 150,000.

**Weather.**—*See* Meteorological table from a number of years' observations in Appendix IV., page 564.

**Communication. — Telegraph. — Railway.**—Hanoi is connected with Haifong by telegraph, which place is connected by submarine telegraph cable with Hong Kong, &c. There is a wireless telegraph, call letters H.A.N., open to the general public between the hours of 6 to 11 a.m. and 2 to 6 p.m.

Mails are bi-monthly, viâ Haifong, by the inland waterways or natural canals. Cargo destined for Hanoi comes from Haifong chiefly by the same route.

The railway runs from Hanoi, viâ Langson, to the frontier of China (Kwang Si); from Hanoi to Haifong; from Hanoi to Ninh Binh,

*General charts 2062, 2660a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

hence to Hué viâ Vinh; and from Hanoi to Vietri and Laokai. See also page 12.

**THE THAI BINH** rises in the mountains to the south-west of the Chinese province of Kwang Si. In the province of Hai Dzung it divides into numerous branches, of which the most important are: The Kua Thai Binh, the Kua Van Uk, the Kua Trai, the Kua Kam, the Kua Nam Trieu, and the Lakh Huen. It is also joined to the Song Ka by several canals; the two most important being the Kua Lok and the Song Chi or Bak Ninh. The tides are felt throughout its whole length, and contrary to what happens in the Song Ka, the yearly rise of the river is small.

The different arms of the Song Ka, of the Thai Binh, and the canals which join them encompass a vast tract of low marshy country of great fertility. All the trade of this district passes through Haifong, at the confluence of the Kua Kam and the Song Tam Bak, the other branches of the delta being only frequented by coasters.

**Mouths.—Kua Thai Binh** (*Lat. 20° 37½' N., Long. 106° 37½' E.*).

—The Thai Binh is navigable for vessels of 13 to 14 feet draught. Its principal mouth, named Kua Thai Binh, is encumbered with banks and divided into two channels. The eastern channel has 5 feet on the bar at low water, but the want of natural leading marks renders access dangerous. Upon the bar of the western channel there is only 2½ feet at low water; springs rise about 10 feet. See Tides, page 273.

**Kua Van Uk.—Channel to Hai Dzung.**—The Kua Van Uk has about 7 feet on the bar at low water, and deep water within. The marks for crossing the bar from the latest information are the peak, 394 feet in height (about 8 miles inland), just open eastward of Conical hill, bearing 336° true. The Gua canal, by which the Kua Van Uk is joined to the Thai Binh, makes this river the shortest route to Hai Dzung.

The four other branches of the Thai Binh debouch in the large estuary comprised between Do Son peninsula and the island Nui Kak Ba.

**Hai Dzung**, 21 miles west of Haifong, the chief town of the province of that name, is one of the largest in Annam, and possesses a citadel.

**Current.**—Between the Delta and Hai Dzung there is usually a current running out of the river at the rate of a half to one knot. Above Hai Dzung, in the narrow portion of the channel leading to Bak Ninh, the current runs from 1½ to 2 knots an hour.

*General charts 2062, 2661a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

**Kua Trai.**—The Kua Trai flows into the channel of the Kua Kam, and has a bar with a depth of about 3 feet on it at low water.

**KUA KAM.**—Old route to Haifong.—The Kua Kam lies close eastward of Do Son peninsula, which attains a height of 430 feet, its extreme.

It was formerly the only frequented channel for vessels of moderate draught proceeding to Haifong. In recent years the bar and the lower part of the river have so altered and diminished in depth that it is practically abandoned for other than light draughts. The chart shows a depth of about 9 feet on the bar seaward of Do Son point, and only 6 feet between lights A and B within that point.

Within the bars the river is navigable as far as its junction with the Thai Binh, 30 miles above Haifong and 46 miles from the sea, for vessels of 10 feet draught.

A canal has been cut through Dinh Vu peninsula from the Kua Nam Trieu to the Kua Kam, some 20 miles above the bars, thus avoiding the Kua Kam entrance, from whence there is a dredged channel along the southern bank of the Kua Kam to Haifong. See Kua Nam Trieu, page 276.

**Dredgers signals.**—Vessels are required to pass dredgers when at work in the approaches to Haifong, or elsewhere in French Indo-China, at slow speed, and to give their mooring chains as wide a berth as possible.

Vessels approaching dredgers are required to sound their siren or whistle at intervals to attract attention, when the dredger will signal on which side the channel is free.

During the day, a red flag denotes that the vessel is to keep the starboard side of the river when going up, and a green flag to the port side. At night, two vertical lights, of same colours as the flags, denote the same course.

**Hon Dau** lies about half a mile off the Little Mirador, with a rock which uncovers in the channel between. It is a pilot station, with a steam tender, and there is semaphore communication between the station and Haifong. See Pilots, page 272.

**LIGHTS** (*Lat. 20° 40' N., Long. 106° 48' E.*).—On Hon Dau, from a grey octagonal tower, 65 feet in height, is exhibited, at an elevation of 203 feet above high water, a *fixed white* light, visible between the bearings of 50° true, through north and west, to 140° true (270°), which in clear weather should be seen from a distance of 20 miles.

From a beacon (A) situated 343° true, distant  $1\frac{1}{10}$  miles from Do Son point, is exhibited a *fixed white* light, visible when bearing from 301° true, through north and east, to 181° true (240°).

*General charts 2062, 2661a, 1263.*

*Chart 775, Approaches to Haifong; also 1965. Var. 1° 30' E.*

From a red pile structure (B), surmounted by a hut, situated 347° true, distant  $3\frac{3}{10}$  miles from Do Son point, is exhibited, at an elevation of 30 feet above high water, a *fixed white* light, visible from the bearing of 314° true, through north and east, to 194° true (240°).

A *fixed red* light is shown from a black iron beacon, surmounted by a hut (C), situated  $3\frac{1}{2}$  miles 326° true of the preceding, visible when bearing from 1° true, through west and south, to 121° true (240°).

CANAL OR CUT.—A *fixed white* light, elevated 32 feet above water and visible from the bearing 137° true, through east and north, to 277° true (220°), is shown from a pile structure, 44 feet high, painted red, erected on Dinh Vu island on the north side of the western entrance to the cut connecting the Kua Kam with the Kua Nam Trieu.

A *fixed red* light is exhibited on the south side of the western entrance to the cut,  $1\frac{1}{2}$  cables from the preceding light; it is shown from a black iron support at an elevation of 23 feet above high water, and is visible when bearing from 92° true, through south, to 312° true (220°). For lights at east entrance to cut, *see* page 277.

A *fixed white* light, elevated 28 feet above high water, is shown from a beacon 47 feet in height, situated on the west side of the western entrance to Vang Chau, visible when bearing from 73° true, through north and west, to 193° true (240°).

**Pilots.**—The pilots cruise between the Norway islands, Kak Ba, and the entrances to the rivers. They fly the French flag, and have a black anchor, their number, and the letter H painted on their sails. When waiting for the tide, vessels should anchor, in fine weather, about 3 miles 81° true of Hon Dau, in a depth of  $4\frac{1}{2}$  fathoms or farther off. Hon Dau is a pilot station.

If there is a heavy swell on the bars of the Kua Kam and Kua Nam Trieu, it may be advisable to go and wait at the anchorage of Kak Ba (page 280), which is accessible to vessels under 19 feet draught.

**Buoys.**—A red buoy is charted three-quarters of a mile eastward of Do Son point, and a black buoy on the western bank, between A and B lights within that point. Above the Cut leading from the Kua Nam Trieu red buoys mark the starboard side of the dredged channel through the upper bar, and black buoys the port side, as charted.

**Landmarks.**—The principal landmarks coming from the southward are Hon Dau with its lighthouse; the Mirador hills on the Do Son peninsula, which will be seen before the island (*see* view on chart 1965); also Nui Voi or Elephant mount, 525 feet in height, situated 17 miles north-westward of Do Son; the summit of the Pagoda range;

*General charts 2062, 2661a, 1263.*

*Chart 775, Approaches to Haifong; also 1965. Var. 1° 30' E.*

a conical hill, 853 feet in height, 12 miles north-north-west of the Elephant; and the Nui Deo, 476 feet high, north-east of the Elephant. The Meteorological Observatory at Fu Lien also forms an excellent mark; it appears as a tower on a very clearly-defined hill (*Lat. 20° 48½' N., Long. 106° 47½' E.*).

**Tides.**—In the approaches to Haifong (Do Son) and also in the approaches to Hanoi, the tides are subject to a large diurnal inequality, only one high and one low water generally occurring in the 24 hours.

The highest tides are found about three days after the moon has attained her greatest north or south declination, and the tides are least about three days after the moon has crossed the equator, at which period the ordinary two complete tides in the day are generally observed.

It is high water about five hours after the moon's superior transit when the moon has north declination, and about five hours after the inferior transit when she has south declination. The tides are higher in the north-east than in the south-west monsoon.

At Do Son peninsula it is high water, full and change, at about 5 hours p.m. in June, and 5 hours a.m. in December. The maximum rise that has been observed is 12½ feet; ordinary rise about 10½ feet; when the tides are very weak the water often remains all day at about mean water level with irregular oscillations. The tide at Haifong is about an hour later.

The flood stream runs to the northward, and the ebb to the southward in the offing.

The difference in time and height of the tide at Do Son, the Norway islands, and other ports in this neighbourhood, is but little.

**Directions.**—These remarks apply to the approach to the Kua Nam Trieu, which is now the main channel to Haifong, as well as the approach to the Kua Kam. The landmarks have been previously mentioned, page 272. Coming from the southward, especially in hazy weather or at night, the lead should be carefully attended to on account of the shallow water off the delta. From the eastward, Bacht Long vi and the Norway islands are good marks. *See view on chart 1965.*

The bank of soundings of about 15 fathoms, between the parallels of lat. 20° 15' and 20° 26' N., and the meridians of long. 106° 45' and 107° 12' E., is said to be a good guide in thick weather; as approaching Hon Dau when bearing about 340° true, the bottom is sand and mud, whilst to the westward nearer the delta, it is nearly all mud, with broken shells in places; and eastward of the line it is chiefly sand with black speckles. Northward of this area the bottom is mud or sand and mud. The 10-fathoms contour line off Hon Dau is 7 miles distant, and appears to be permanent.

If a pilot has not been picked up in the offing, a vessel should

*General charts 2062, 2661a, 1263.*

*Chart 775, Approaches to Haifong; also 1965. Var. 1° 30' E.*

approach Hon Dau lighthouse on about a 317° true bearing, anchoring to the eastward of it if necessary, as mentioned under the heading of Pilots, page 272, until one has been obtained.

**Entering the river.**—The channel is available for small craft. Deeper draughts use the Kua Nam Trieu (page 276). The channel is marked by red buoys on starboard hand and black buoys on the port hand, as before mentioned with the buoyage; within the bar there is no difficulty. The summit of Pagoda range in line with the trees on the east point of the entrance, bearing 314° true, leads in from seaward between Do Son point and the outer red buoy.

*Inset of Haifong on chart 775.*

**Anchorage.**—The river at Haifong is 2½ cables wide, with depths of 4 to 6 and 8 fathoms; a number of vessels could be berthed there.

Vessels can anchor either above or below the mouth of the Song Tam Bak, the former seems preferable; it is advisable to moor.

**Moorings.**—A mooring buoy for the use of the steamers of the Messageries Maritimes Company is placed in the anchorage above Haifong, and there are several moorings for small craft.

The Song Tam Bak connects Kua Kam with Kua Trai, and is available for small craft under 6 feet draught. The two mouths of the Song Tam Bak encircle the town of Haifong; the upper mouth is the Tra lo, and the lower is the Bonnal canal.

**HAIFONG** (*Lat. 20° 52' N., Long. 106° 40' E.*), on the right bank of the Kua Kam, between the two mouths of the Song Tam Bak, about 16 miles above the entrance, is the shipping port for Hanoi, Hai Dzung, and Nam dinh, the commercial centres of Tong King. It is connected by canals or creeks with the Thai Binh and Song Ka, for which, *see* the charts. The banks of the river are low and consist of alluvial mud, from which the present town has been reclaimed. The native part of the town consists of wretchedly built huts of bamboo, but the European part has broad boulevards lighted by electricity. The Hotel de Commerce is a large and conspicuous building fronting the creek and river; there are large barracks, and a fine hospital at Luang yen.

In the distance are rugged limestone hills, and beyond these to the northward, some 18 miles, is a range of mountains culminating in the Grand Summit, 3,609 feet in height.

**Depth to.**—Vessels of 24 feet draught can, at high water springs, reach Haifong by the Kua Nam Trieu, page 276. It is stated that a vessel of 27 feet draught has been seen there.

**Population.**—The population of Haifong (1910) was 20,000, of whom 1,000 were Europeans (not including the officials and garrison), 5,000 Chinese, 12,000 Annamites, &c.

**Communication.**—The following steamship lines call at Haifong. The Messageries Maritimes from Saigon, Europe, &c., run *General charts 2062, 2661a, 1263.*

*Inset of Haifong on chart 775; also that chart. Var. 1° 30' E.*

weekly, with a cargo boat once a month, and several other French steamship companies call frequently. The Messageries Fluviales steam vessels ply between all the navigable ports of Tong King, and a company runs vessels between Haifong and Hong Kong. A bi-monthly postal service is run between Haifong and Kwang chau wan, calling at Pakhoi and Hoi hau. A branch steamer of the Messageries Maritimes, which conducts the service between Saigon and Hong Kong, calls here bi-monthly.

A regular river service of steamers is maintained between Haifong and Hanoi, through the inland waterways. Cargo destined for Hanoi goes the same way. Hanoi (and therefore Haifong) has steam communication along the Song Ka or Red river to Laokai, the nearest frontier town to Mengtsz, and where there is a railway to various parts.

**Railway.**—Haifong is connected by railway with Hanoi, thence with Langson, Laokai, and the frontier province of Kwang si, China; from Hanoi to Vinh, &c., *see* page 12.

**Telegraph.**—Haifong is connected with the telegraph system of Indo-China, and by submarine cable with Saigon. Office always open. There is a wireless station at Kien au, or Fu Lien, one mile south-west of the observatory, open to the general public between the hours of 6 to 11 a.m. and 2 to 6 p.m.

**Time.**—Correct time, for chronometer comparisons, may be obtained at the post-office by telephone from Fu Lien observatory.

**Products.**—The exportation of rice is the most important article of commerce; other exports are silk, gambier, mother-of-pearl, &c. The imports are chiefly cotton goods and manufactured articles.

**Supplies** can be easily obtained. Water for drinking purposes is good; it is brought to the town by an aqueduct from the source of the Song Huong, situated in the mountains of Dong Trieu, 19 miles distant.

**Wharves.**—There is a wooden wharf at Haifong, 300 yards long and 10 yards broad, with a depth of 22 feet alongside at low water; it is connected to the mainland and the railway system by three bridges.

There is a fixed 15-ton crane at the northern end of this wharf, which, in 1908, was being extended 160 yards to the westward. There are other fine wharves, and sheers capable of lifting 20 tons.

There are two wharves on the right bank of the Bonnal canal for small craft, and one lower down for larger vessels.

**Repairs.**—Vessels over 300 tons capacity are built here, and repairs to vessels and machinery can be effected. A steam crane is available for lifting a weight of 50 tons; there is a patent slip for small craft.

**Docks, proposed.**—*See* Appendix II., page 559.

*General charts 1965, 2062, 2661a, 1263.*



*Inset of Haifong on chart 775; also that chart. Var. 1° 30' E.*

**Coal.**—There is generally a considerable stock of coal kept here.

**Shipping.**—In 1907, 209 vessels (exclusive of Chinese vessels) entered, of the aggregate tonnage of 151,490 tons, and 249 vessels cleared, of 255,486 tons.

**Storm signals.**—The system of typhoon and storm warning signals now in use at the semaphores of the Imperial Maritime Customs on the coast of China and at Hong Kong has been established with slight additions (shown in italics in series 6) by the French Government at the semaphores in Indo-China. *See* page 32.

The signals at Haifong are shown from a flagstaff upon the old tower of the semaphore station.

**Local signal.**—The B flag of the International code above a black ball signifies: Order to the vessels moored to the wharves at Haifong to haul off.

*Charts 775, 1965.*

**KUA NAM TRIEU.**—**Channel to Haifong.**—**Depths.**—Since the silting up of the Kua Kam, vessels of moderate draught use the Kua Nam Trieu, thence proceeding through the Dinh Vu canal into the Kua Kam, which it enters about 4 miles below Haifong. The depth on the bar has been dredged to 15½ feet at low water springs (1911); above the bar the water is deeper in the river and in the canal; from thence there is a dredged channel in the Kua Kam, marked by buoys, in which there is a low water depth of about 16½ feet, above this the channel deepens to Haifong. Vessels of about 24 feet draught can go to Haifong at high water springs, and those of about 15 feet at all times, day or night, in charge of a pilot. *See* Haifong, page 274.

**Dinh Vu canal** is an artificial cut through the centre of Dinh Vu island, and connecting the Kua Kam with the Kua Nam Trieu, thus affording deeper water to Haifong. It is nearly a mile in length, 131 feet in width at high water, and has a depth of 19½ feet at low water.

Every steam vessel desiring to pass through the canal must conform to the following rules and possibly others which will be known to the pilot:—

Vessels are not permitted to enter the canal unless the weather is sufficiently clear to enable them to see its further end, and to be assured that no other vessel has entered from the opposite direction. When two steamers arrive at the same time from opposite directions for the canal, the one arriving by the Kua Nam Trieu must wait until the steamer coming from the Kua Kam has passed through, and must anchor if necessary.

Vessels in the canal are to proceed at the lowest possible speed.

*General charts 2062, 2661a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

Four mooring posts for securing vessels to are in position on each side of the canal; a pathway runs along both sides.

**NOTE.**—If possible, the Captain of the Port of Haifong should be informed beforehand by the agents of the vessel, as to the date and time of their expected arrival, so that necessary instructions may be given to the dredgers when dredging is in progress, and to the pilots. See Signals from dredgers, page 271.

**LIGHTS.**—The following lights are exhibited in the Kua Nam Trien and the eastern entrance to the canal or cut:—

Hon Dau, on the west side of the approach, has been described with the Kua Kam, page 271.

South-eastward of Dinh Vu island, on the sandbank extending therefrom, at the distance of  $3\frac{3}{4}$  and  $2\frac{1}{4}$  miles, respectively, are two *fixed* leading lights for the bar, each visible at the distance of about 6 miles.

The front light is *red*, elevated 27 feet above high water, shown from a black shed on piles, and visible from the bearing of  $318^\circ$  true, through west and south, to  $138^\circ$  true; the rear (or inner) light is *white*, elevated 46 feet above high water, shown from a black lantern on piles 63 feet high, and visible between the bearings of  $316^\circ$  true, and  $291^\circ$  true. These lights in line, bearing  $303^\circ$  true, lead over the bar.

About  $4\frac{1}{2}$  miles north-north-westward of the preceding are two *fixed white* lights, exhibited from lanterns on red piles, to lead up the fairway after crossing the bar to the first bend. The front light (*Lat.  $20^\circ 50' N.$ , Long.  $106^\circ 48' E.$* ), elevated 27 feet above high water, is visible from the bearing of  $300^\circ$  true, through north and east, to  $120^\circ$  true ( $180^\circ$ ); the rear light, elevated 54 feet above high water, is visible between the bearings of  $343^\circ$  true and  $318^\circ$  true ( $25^\circ$ ). The light-structures are in line when bearing  $330^\circ$  true.

From a red pile structure, 52 feet high, at the eastern entrance of the canal cut through Dinh Vu island to the Kua Kam, a *fixed* light is exhibited at an elevation of 29 feet above high water, showing *red* from the bearing of  $240^\circ$  true, through south, to  $150^\circ$  true ( $90^\circ$ ); *white* elsewhere.

A *fixed red* light is exhibited on the southern point of this entrance,  $1\frac{3}{4}$  cables from the light last mentioned; it is shown from a black iron support at an elevation of 24 feet above high water, and is visible 2 miles when bearing from  $312^\circ$  true, through west and south, to  $92^\circ$  true ( $220^\circ$ ).

(For the lights at the western end of the canal or cut, see page 272.)

At the southern point of the eastern entrance to Vang Chau, a *fixed red* light is exhibited from a black beacon, on piles, 51 feet in height, at an elevation of 30 feet above high water, visible when bearing from  $340^\circ$  true, through west and south, to  $55^\circ$  true ( $285^\circ$ ).

*General charts 2062, 2660a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

On the Bancs d'Annam (*Lat. 20° 55' N., Long. 106° 45½' E.*), situated 33° true, 2¾ miles from the preceding, a *fixed white* light, elevated 31 feet above high water, is exhibited on the eastern side of the channel, from a pole over a shed on pile structure, painted red; it is visible when bearing from 344° true, through north and east, to 224° true (240°).

On the northern side of the junction of the Song Chang with the Kua Nam Trieu, a *fixed green* light, elevated 28 feet above high water, is exhibited from an iron pile structure, painted red, visible when bearing from 276° true, through north and east, to 186° true (270°).

**Buoys at entrance.**—Four iron conical buoys, each painted red and surmounted with staff and cone, are moored at about equal distances on the bar of the river, in a direction nearly parallel to the line of the leading lights over the bar. The outer buoy is charted 6½ miles, 121° true, of the outer light-structure, in a depth of 21 feet, near the edge of the 3-fathoms contour. For others *see* the charts; the positions have probably been changed to meet the alterations effected by the dredging of the channel.

A black conical buoy is moored in a depth of 13 feet, near the south-eastern extremity of the sandbank extending from Dinh Vu island, abreast the inner red buoy.

**DIRECTIONS.**—*See* the directions for approaching the Kua Kam, page 273, which apply also to this river; also view from the offing on chart 1965.

The bar of the Kua Nam Trieu is formed of rather hard muddy sand. Nui Deo summit in line with a clump of trees on the west point of the entrance bearing 311° true, formerly led over the bar in 10½ feet at low water springs; the bar has been dredged (1910) to a low water depth of 15½ feet, or 26¼ feet at ordinary high water springs, probably the same leading mark applies, but the vessel should be in charge of a pilot. Vessels of 24 feet draught can proceed to Haifong as before mentioned. *See* also Haifong, page 274.

Proceeding up the river, keep the above marks on until the large tree near the east point bears 44° true, then the east bank should be approached and steered along at a distance of 2 to 3 cables (or the light-structures above in line may be steered for if they can be made out). When about 4 cables from the red pile light, steer a mid-channel course to the entrance to Dinh Vu canal.

**At night.**—Vessels in charge of a pilot can enter at night; the outer pair of leading lights in line lead over the bar.

**Dredged channel to Haifong.**—Having passed through the canal, the dredged channel, 16½ feet at low water, through the inner bar along the southern bank of the Kua Kam, marked by red buoys on

*General charts 2062, 2660a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

the starboard hand and black buoys on the port hand should be followed; above which the water is deeper to Haifong.

**Anchorage.**—*See page 274.*

**Nam Trieu above the canal.**—From abreast the canal a mid-channel course will lead to the Vang Chau, referred to below; before arriving abreast it, keep towards the east bank, steering along it until abreast the clump south of Kwang Yen. Here the river is nearly blocked by rocks, leaving a passage near the eastern shore between the Bancs d'Annam light-structure, painted red, and the conical buoys with cylindrical topmarks, painted black, marking the rocks westward of it.

There is anchorage abreast the creek of Kwang Yen in about 4 fathoms, muddy sand.

**Above Kwang Yen** the Nam Trieu becomes a creek, and communicates with the Kua Kam by several watercourses encumbered with rocks and very shallow; the principal of these is the Song Gia, which flows between mountains, among which seams of coal have been found.

**The Vang Chau**, a narrow and winding creek, situated 3 miles below Kwang Yen, connects the Nam Trieu and the Kua Kam one mile below Haifong. The banks are low and covered at high water, so that the passage would be difficult if stakes were not placed to show the channel; for depths *see* the chart. The entrances are lighted, as mentioned with the rivers in which they are situated.

**LAKH HUEN** (*Lat. 20° 50' N., Long. 106° 52½' E.*).—The Lakh Huen is the most northern and eastern mouth of the Thai Binh. It communicates with the Nam Trieu by the Song Chang, 5 miles up which is Kwang Yen, the chief town of the province of that name, mentioned above.

**Light.**—A *white fixed* light, elevated 30 feet above high water and visible from the bearing of 226° true, through west and north, to 136° true (270°), is exhibited from a column surmounting an iron pile structure, painted red, erected to the southward of Mangué island.

**Bar.—Directions.**—Vessels drawing 16 feet can cross the bar at high water springs, and proceed in deeper water to the mouth of the Song Chang. There is not less than 10 feet at low water to within 2 miles of Kwang Yen, but from thence into the Nam Trieu there is as little as 2 feet.

The channel across the bar is narrow, and but little protected from the sea; the marks also are distant and often indistinct. The small rock marked A (the south-westernmost of those off Port Kak Ba) in

*General charts 2062, 2660a, 1263.*

*Charts 775, 1965. Var. 1° 30' E.*

line with the eastern part of the second group of the Norway islands, bearing 126° true, astern, leads over the bar in from 19 to 21 feet at high water springs. (Rock A should be approached from the south-westward to avoid the dangerous rocks southward of the islands of Kak Ba bay.) When Pirates point bears 332° true, steer midway between the entrance points, and when approaching the pile light-beacon off Pirates point, keep the western bank if bound to the anchorage below Kwang Yen, before mentioned.

**Channel to Ha Long bay.**—There is a channel with about 6 feet at low water, marked by stakes or beacons, eastward of Mangué island leading to Ha Long bay, available by small craft with local knowledge. *See* tides at Do Son, page 273.

*Charts 775, 1169.*

**KAK BA ISLAND and Anchorage.**—Nui Kak Ba is about 11 miles in length in a north and south direction, about 6 miles in breadth, and attains a height of 1,083 feet, near the centre of the range running through it. Off its south extreme are several high and rocky islets, the outermost of which are named the Quille and Oreilles islets. B island, one of the group, is 410 feet in height.

Between these islets and the south side of Nui Kak Ba is Kak Ba anchorage (*Lat. 20° 43' N., Long. 107° 1' E.*), with the Chinese village of Apowan on its north-east shore. Vessels under 20 feet draught find good anchorage here in the north-east monsoon period, but it is exposed to the south-west. The entrance is about half a mile wide between H island and the one westward of it, with depths of 4 fathoms, shoaling gradually towards the village.

For eight months in the year, during the north-east monsoon, this harbour affords shelter to numerous Chinese fishing junks. Supplies can be obtained at the Chinese village at the head of the harbour, and water from a well, but it is sometimes dry at the end of the north-east monsoon. Bengali bay to the north-westward is shallow.

There is a Custom-house and a blockhouse at the village.

**A patch** of 1½ fathoms lies on the edge of the 3-fathoms line westward of the anchorage, 85° true, distant 7 cables from the summit of B island.

**Shoals in the approach.**—Ta lao pai (Offing rock) (*Lat. 20° 39½' N., Long. 107° 4' E.*) lies nearly midway between Quille islet and the Norway islands (page 280); it is low compared with those islands, and about 3 miles from either.

There is a patch of 6½ fathoms at about half a mile west-south-westward of it, with 12 to 13 fathoms around, uneven bottom.

*General charts 1965, 2062, 2660a.*

*Charts 775, 1169. Var. 1° 30' E.*

**Pinnacle rock**, with 5 feet water, and steep-to, lies about half a mile 323° true of Ta lao pai; there is a patch of  $1\frac{1}{4}$  fathoms at 2 cables south-eastward of Pinnacle rock; others may exist in this neighbourhood.

A ledge of 2 fathoms extends  $1\frac{1}{2}$  cables north-west of Oreilles islets, and one of  $2\frac{1}{2}$  fathoms at about the same distance south of Quille islet or Ninepin rock.

At about 6 cables south-south-eastward of the Quille is a rocky bank, with  $3\frac{1}{2}$  fathoms least water. It forms part of a rocky plateau about 3 cables in extent. The passage between it, and Quille islet is not recommended.

**Dangerous rock**, with  $1\frac{1}{4}$  fathoms least water, lies one mile 263° true from the Quille, with depths of 4 to 7 fathoms close around. Rock A in line with F island (*view on 1169*) leads well to the westward of it.

A rock with one fathom water, lies a cable west of the north end of the islet, situated about 2 cables south-east from the south end of H island.

**Directions.**—To enter Kak Ba anchorage, steer for H island, on the east side of the entrance, easily recognisable by its conical summit. The west extreme of H island, kept northward of the bearing 7° true, leads eastward of Dangerous rock; and the same point kept eastward of 27° true leads to the westward. The north-west extreme of H island should be passed at about the distance of a cable. Vessels drawing less than 14 feet can enter the harbour from the south-eastward, passing between high precipitous islets about three-quarters of a cable apart. *See view on chart 1169.*

*Chart 1169.*

**NORWAY ISLANDS** or **SUI NONG TAO** are situated about 6 miles from the archipelago of the Kak Ba; they consist of two groups, the easternmost of which is visible from a distance of 20 miles in clear weather, and is a natural landfall for vessels going to Haifong, &c. The islands are high, inaccessible, and free from danger on the south. The largest island has a creek on its eastern side which affords shelter to small craft. *See view of the coast westward on 1965.*

At  $1\frac{1}{2}$  cables westward of the north-westernmost island there is a rock, with a depth of 4 feet, situated  $1\frac{7}{10}$  miles 274° true from the light-house.

**LIGHT.**—From a grey circular tower, 98 feet in height, erected on the eastern side of the largest of the Norway islands, is exhibited at an elevation of 361 feet above high water, a *flashing white light* showing a flash *every five seconds*, and visible in clear weather from a

*General charts 1965, 2062, 2660a.*

*Chart 1169. Var. 1° 30' E.*

distance of 26 miles. This light is sometimes obscured by mist, owing to its elevation, when the weather appears clear from an approaching vessel. It is also occasionally obscured on certain bearings by the other islands of the group.

**Sam poni tsao**, or **False Ninepin**, lies 325° true  $2\frac{3}{10}$  miles from the lighthouse; it is a pointed rock, the eastern of a group of three islets. A patch of 2 fathoms lies a cable southward of it; and a rocky ledge, with less than 6 feet water, extends about the same distance northward of the western islets. The dangers between them and Kak Ba are described on pages 280, 281.

*Chart 1965, Song Ka delta.*

**BACHT LONG VI** (*Lat. 20° 8½' N., Long. 107° 42' E.*), White-tailed Dragon or Nightingale island, is situated about 43 miles south-eastward of the Norway islands, near the middle of Tong King gulf, and from its position is a good landmark for vessels bound to Haifong, Hongai bay, or the head of the gulf. It is about 1½ miles in length, triangular in shape, and 190 feet in height; its summit is a plateau and its sides are precipitous in places, with trees in other parts on the slopes. The island is surrounded by sunken rocks extending from a half to three-quarters of a mile, with depths of from 7 to 10 fathoms beyond; it is advisable to give it a berth of about 2 miles. Shoals of fish are very plentiful in the neighbourhood, and have been taken for breakers when seen from some distance.

## THE FAI TSI LONG ARCHIPELAGO.

*Charts 1169, Approaches to Port Courbert; also 1965.*

**GENERAL REMARKS.—Anchorages.**—North-eastward of the Song Ka delta, the coast of Tong King to the Chinese frontier is bordered by innumerable high rocky islands and islets of limestone formation, presenting a most varied form, with sharp or rounded, though distinct summits, some of them attaining a height of about 1,000 feet. The Norway islands make a good landfall, whilst the island of Lai Tao, with its conical summit on the east side of the approach to Ha Long bay, and the look-out hill, 980 feet in height, on the north side of Ha Long bay, are conspicuous objects.

Among these islands are several deep-water channels which lead to secure anchorages, the only ones available for large vessels on the coast of Tong King. The principal channels are:—

Henriette pass, which leads to Ha Long bay, where there is good and secure anchorage, in depths of 5 to 8 fathoms, northward of Surprise island, with not less water in the approach.

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

The Tai co tai channel, westward of Henriette pass and of Paix island, leading from Lan ha bay to Crapaud road, and thence to Ha Long bay.

The Casque and Mouche passes, which lead into Saone channel and Fai Tsi Long bay, where there are depths of 7 to 12 fathoms; the approach is common to both, and has a depth of 4 to 5 fathoms at low water over a flat, about 5 miles in length; the Casque pass is the wider and deeper of the two.

Pak ha mun also affords secure anchorage in about 8 fathoms, with 6 to 7 fathoms in the approach.

These anchorages afford fair shelter during typhoons, being practically landlocked; the holding ground is good. Within them and along the coast to the north-eastward are other secure anchorages, and a smooth water channel available for vessels of light draught with local knowledge.

During the strength of the north-east monsoon there is a considerable swell in Fai Tsi Long bay, but in the others it is scarcely felt.

From a distance, these islands appear to form a compact mass, but on being approached the channels through them will be distinguished. Some of the islands are inhabited, but no supplies are obtainable, and water is scarce.

The channels are described in detail in the following pages.

**Climate.**—The heat in summer is greater among the islands than in the delta or to seaward, on account of the islands obstructing the breeze; the thermometer at this season sometimes shows 100°. The lowest temperature in the winter is 46° to 50°. See Meteorological table for Hanoi in Appendix IV., page 564.

From December to March fogs are frequent and persistent.

**Pilots.**—A vessel is certain to obtain a pilot for the archipelago at Hon Dau, off the entrance to the Kua Kam. See page 272.

**Tides.**—It is high water, full and change, at Fai Tsi Long archipelago at about 5 hours, the same as at Do Son, but the rise is somewhat greater and increasing towards the north, it being 12½ feet at Ha Long, and 14 feet at Kebao.

**The tidal streams** among the islands attain a rate of 2 knots an hour in places where confined; in the offing the streams run from one to 1½ knots an hour; the flood coming from the south-west, and the ebb from the north-east; off Kebao the streams run nearly tide and half tide.

**SOUTHERN APPROACH.—Dangers.**—The dangers on the western side of the approach to Henriette, the main channel to Ha Long bay, namely, the Norway islands, and the dangers between

*General charts 2062, 2661a.*



*Charts 1169, 1965. Var. 1° 20' E.*

them and the coast are described on pages 280, 281. The following lie on the eastern side of the approach, namely:—

**Chi li pai**, situated in lat.  $20^{\circ} 41' N.$ , long.  $107^{\circ} 20' E.$ , about 9 miles  $58^{\circ}$  true of the most eastern of the Norway islands, is the outermost danger of those extending about 6 miles westward of Lai Tao island, forming the eastern side of the approach. It consists of a group of rocks nearly a mile in length in an east and west direction, some of which are always covered; the bottom is foul to the distance of half a mile from it in places; a patch of 3 fathoms is charted nearly half a mile northward of the rocks.

**Salpes reef**, which dries 11 feet at low water springs, lies  $344^{\circ}$  true  $1\frac{4}{10}$  miles from Chi li pai, with foul ground between; at one mile  $333^{\circ}$  true from Salpes reef is a patch of  $1\frac{3}{4}$  fathoms, and at 6 cables  $32^{\circ}$  true from Salpes reef is a rock which dries 2 feet; there is irregular bottom all around these shoals, and no vessels should pass between them and the islands eastward of them, as, no doubt, other dangerous patches may exist.

**Cape Koan Lan or Koan Lan islands.**—The south-western and outermost of the Fai Tsi Long archipelago comprise four lofty and precipitous islands, several smaller ones, and the dangers above described, and are as follows:—

**Lai Tao** (*Lat.  $20^{\circ} 43' N.$ , Long.  $107^{\circ} 26' E.$* ), the southernmost island, lies about 6 miles southward of Cape Koan Lan, the south-west extreme of the long and narrow island named Koan Lan. It is 2 miles in length, and is steep-to on its southern side beyond the fringing reef, but a patch of  $2\frac{1}{2}$  fathoms, with deep water around, lies  $11\frac{6}{10}$  cables  $226^{\circ}$  true from the southern summit of Lai Tao.

**Siong Lai Tao**, north-eastward of it, is somewhat smaller, with outlying rocks; northward, between it and Cape Koan Lan, is the islet of Kao pui Tao, with rocks above and below water between it and Siong Lai Tao, and a reef extending north-westward of it.

**Fong Wong.**—Between Cape Koan Lan and Fong Wong island, 771 feet high, 3 miles westward of it, the water is shallow and dry in places. Fong Wong is rocky, wooded, and inhabited.

Maolintao islet lies on the flat, extending eastward of Fong Wong, eastward of which the chart shows anchorage in about  $5\frac{1}{2}$  fathoms.

**Timatao and Baou Tao**, westward of it, lie on the same shallow flat, from one to 2 miles south-westward of Fong Wong, with depths under 3 fathoms southward of them. Between Timatao and Lai Tao are several shoal heads; the least known depth,  $1\frac{1}{2}$  fathoms, lies about three-quarters of a mile northward of the west extreme of Lai Tao.

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

**Danh Do la** and **Dao Trao** lie between **Fong Wong** and the west extreme of **Longue island**, and form the eastern side of approach to **Casque pass**.

There is an important village on **Koan Lan (Van hai) island**, a long and narrow island 10 miles in length between its south extreme, **Cape Koan Lan**, and the entrance to **Kua Doi**. The village is under a chief—a dependent of the administrator of **Kwang Yen**. Supplies of poultry, pigs, &c., are procurable, but the water is scarce and of doubtful quality. Boats can reach it through gullies in the banks fronting the village. (*Position not stated.*)

**Caution.**—Craft, with local knowledge, pass between the islands, and there is temporary anchorage amongst them, but the locality is better avoided by strangers. The bay westward of the cape between it and **Danh do la** and **Dao Trao** islands is shallow, with numerous fishing stakes.

**HA LONG BAY** and **Port Courbet** approaches.—**Ha Long bay**, situated northward of the island of **Kak Ba** at the north-west extreme of the **Fai Tsi Long** archipelago, is about 5 miles in extent, and very shallow, except the narrow southern portion of it, which part is available from seaward for all classes of vessels. On its north-eastern side is **Hamelin channel** leading to **Port Courbet**, in which there is a least depth of about  $11\frac{1}{2}$  feet at low water.

There are also channels leading eastward through **Fai Tsi Long bay** and archipelago, and to the westward is a channel for vessels of light draught, with 6 feet at low water, leading to **Lakh Huen** and the delta of the **Song Ka**, before mentioned, on page 280.

**Entrances.**—The principal entrance to **Ha Long bay** is the **Henriette pass**, page 287, which is available for all classes of vessels, with anchorage between **Surprise** and **Index islands**, 9 miles above the entrance, in depths of from 6 to 8 fathoms; at one mile above this, the depths are under 3 fathoms, with less than one fathom over the greater portion of **Ha Long bay**; there is, however, a channel, the **Hamelin**, in the eastern part of the bay, leading through the flats to **Hongai bay** and **Port Courbet**, above mentioned.

The **Tai co tai channel**, or **Entrée Profonde**, westward of **Henriette pass** and of **Union** and **Paix islands**, and leading from **Lan ha bay**, is narrow, but deep as far as **Crapaud road**, whence to **Ha Long bay** by either the **Volta channel** or **Arche pass**, there is at low water as little as  $3\frac{1}{2}$  fathoms in places. All these channels are equally used and said to be easily navigable after a first visit, but the **Henriette** only should be used by vessels above moderate draught, not only on account of its greater depth, but being much wider, there is less tidal stream.

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

**Anchorage.**—See page 288.

**Pilots.**—There is a pilot station at Hongai, at the entrance of Port Courbet, from whence pilots go out to the mouth of the Henriette channel when a vessel is expected.

To ensure having a pilot for entering Fai Tsi Long bay, a vessel should take one in off the Kua Kam, from or near Hon Dau, a pilot and semaphore station, page 272.

**LAN HA BAY**, the westernmost channel to Ha Long bay, is about 2 miles wide between Paix island and the islets fronting the mainland to the westward, with good anchorage, in depths of 8 to 9 fathoms, easy of access. The eastern side of the bay, formed by Paix, Union, and other islands, is high, steep, and nearly continuous; on the western side are deep inlets and numerous islets, also affording secure anchorage. The passage between Union and Paix islands is barred by a ledge of rocks.

**Su li pai reef** (*Lat. 20° 42½' N.; Long. 107° 4½' E.*), which dries 9 feet, is the only danger on the west side of the bay; it lies 9 cables 57° true from M island, and about 8 cables southward of Cornu islet. A rock about 1½ cables in diameter, with a depth of 4 feet, lies 170° true about 1½ cables from Su li pai reef.

Oreilles islets open northward, or the Ninepin rock open southward, of M island, leads clear of Su li pai reef.

The outer danger on the eastern side is the 1½-fathoms patch, 6½ cables southward of Henriette islet.

**Anchorage.**—There is good anchorage for small vessels in about 4 fathoms about 1½ miles to the north of M island, and westward of the outer islets on the west side of Lan ha bay. A rock, uncovered at low water, lies in the southern channel leading to this anchorage, and a second rock, which dries 2 feet, lies in the north-east channel; both these rocks will be avoided by keeping towards the island on the star-board hand when entering either channel.

**Parseval bay and Port Bayard**, on the west side of Lan ha bay, afford excellent protection to vessels of light draught, in 2 to 3 fathoms, in case of a typhoon; but the entrances are narrow, especially that of the latter, the width between the rocks on either side being only 80 yards.

**Tai co tai (Entrée Profonde)** is the channel leading northward from Lan ha bay to Crapaud road, and has not less than 8 fathoms water, though it is narrow, avoiding charted dangers on either side.

**A rock**, with 1½ fathoms water, lies three-quarters of a cable 254° true from the south-western islet, situated westward of Saddle mountain on Union island.

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

**Crapaud road** (*Lat. 20° 49½' N., Long. 107° 5' E.*), entered from Lan ha bay by the Tai co tai, or from the eastward by Crochet pass, affords good and sheltered anchorage in 7 fathoms mud, with Crapaud rock, bearing 150° true, distant about two-thirds of a mile. This sheltered anchorage is the most accessible for a large vessel, expecting a typhoon, when in the neighbourhood of Kak Ba or the Norway islands.

**Volta channel and Arche pass.**—Either of these lead to Ha Long bay, and each have a least depth of 3½ fathoms at low water springs; the former is the straighter of the two, and it is only necessary to keep in mid-channel.

To enter the Arche pass from Crapaud road, keep close along all the islets on the south side of Crochet pass, until nearly abreast those northward of Grottes island, following the pecked line on the chart. Then steer up through the fairway into Ha Long bay. A vessel could continue through Crochet pass into the Henriette, thence to Ha Long bay.

**HENRIETTE PASS**, the best approach to Ha Long bay and Port Courbet, lies between Henriette islet and Orange islet, 150 feet high, one mile eastward of it. Orange, Epieu, Sentinelle, Fantome, 154 feet high, Jonque islets, 203 feet high, and others on the eastern side, appear detached when approaching the channel, whilst those to the westward seem to form with Paix island a compact mass. *See view a on page 288.*

**Dangers.**—The dangers near the track through Henriette pass are as follows: The reef extending 4 cables southward of Henriette islet, with a patch of 1½ fathoms and steep-to, at 6½ cables, 167° true, from the islet. A patch of 6½ fathoms at 1½ cables southward of Orange islet, and one of 4½ fathoms or less at 2 cables south-east of Epieu or South-east islet, on the eastern side of the approach.

In the pass is a rock, with less than 6 feet water, at a distance of 2½ cables, 248° true, and another at 4½ cables, 278° true, from Jonque islet; patches of one and 3½ fathoms lie, respectively, at 4 and 2 cables, 312° true, from Yuyu, and a patch of 4½ fathoms at nearly a cable's distance northward of that islet; a ledge with 2 fathoms water extends half a cable eastward of Nez islet, and close westward of the track; other patches are too near the islands to require attention, and will be seen on the chart.

**Tides.**—At high water there is a slight northerly set in the pass, gradually turning westward and south-westward; at about 3 hours after high water the ebb stream is established, running southward in the direction of the pass; it attains its maximum rate of one to 1½ knots at 7 hours after high water. *See Tides, page 283.*

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

**Directions.**—To enter Henriette pass, having given a berth to the eastern island of the Norway group, bring that island to bear 161° true astern, which will lead to the middle of the fairway between Henriette and Orange islets.

The summit of Banane island in line with the low plateau on the western edge of Index island, bearing about 338° true, leads from abreast Orange islet direct to Index island clear of all dangers, but a berth should be given to the 2-fathoms ledge extending off Nez islet when passing it. Views *b* and *c* on page abreast, and *B* on chart 1169. When near Index island, haul to the westward for the anchorage, unless proceeding to Port Courbet by Hamelin channel, for which *see* page 289.

The least breadth of the channel is about a third of a mile, and in the fairway there is not less than 7 fathoms until abreast Moine island, above which, abreast and westward of Index island, is good anchorage, as below described.

**Anchorage.**—There is secure anchorage for vessels of deep draught, in depths of 6 to 8 fathoms, mud, good holding ground, in Noix islet anchorage, between Surprise and Index islands, where Henriette pass is one mile wide, and it is much cooler here than farther in, being more open to the sea breeze.

About one mile above, there is anchorage in 5 to 6 fathoms abreast Hopital island (*Lat. 20° 52½' N., Long. 107° 4½' E.*); above this there is anchorage for vessels of light draught as convenient. The other channels leading from these anchorages are marked by pecked lines.

**To Port Courbet.**—The anchorages mentioned above are about 6 miles, in a direct line across the banks, from the coaling station in Port Courbet.

**Buoy.**—Light-draught vessels can cross the banks with a depth of 6 feet at low water springs, and from 16 to 18 feet at high water springs, by passing eastward of the red and black conical buoy marking a rock awash at low water, situated  $2\frac{4}{10}$  miles, 281° true, from the summit of Banane island; between it and Palourde islet, 9 feet high, at  $1\frac{1}{2}$  miles north-eastward of it. Hamelin channel, page 289, is 6 feet deeper.

**Supplies.**—Fishermen frequent Ha Long bay, from whom fish are procurable. Provisions are obtainable from Hongai, page 290; also from Haifong. Fresh water for the French vessels of war is brought to this anchorage from Haifong.

**Channel to Haifong.**—There is a channel for small craft, with about 6 feet at low water, beaconed or marked by stakes, leading from Ha Long bay anchorages, through Cathedral channel and its continuation westward to Lakh Huen and Nam Trieu, and thence to Haifong, available with local knowledge, as before mentioned, pages 280 and 285.

*General charts 2062, 2661a.*

# Approaches to Port Courbet. Henriette Pass.



(a)

*Henriette Islet.*

*Cirque I.*

*Jouque I.*

*Orange I.*

*Epieu I.*

View of entrance to Henriette Pass at 4 miles southward of Henriette Islet.



(b)

*Banane I. Saddle.*

*Index I.*

The summit of Banane I. in line with the plateau on west edge of Index Island, bearing 33° true leads from seaward and up the fairway.



(c)

*Nez I.*

*Index I.*

*Bonnet Phrygien.*

*Echelle I.*

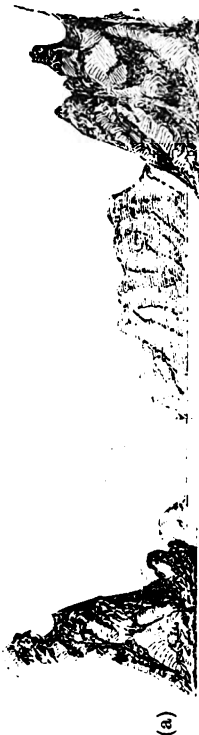
From near Yuyu Islet. Islands bordering the track.







# Approaches to Port Courbet. Views in Hamelin channel.



(a)

From within the Entrance.

Moine I. Salacco I. Goeland I.

Bonnet Phrygien.

Index I.

Salacco island summit, seen about midway between Goeland and Moine islands, bearing  $131^{\circ}$  true, astern, leads through the entrance between Bonnet Phrygien and Index islands, up to view b.



(b)

Islands west of Voile.

Marron Rock.

Marron rock just open eastward of the islands westward of Voile I., bearing  $55^{\circ}$  true, leads southward of Tourelle I. and the rock south-west of it.



(c)

La Toque.

Toque islet in line with the east point of Rhinoceros island, northward of Potchinelle island, bearing  $1^{\circ}$  true, leads to Hamelin channel from view b.



(d)

Pain de Sucre, Toque I.

Frangé I.

Toque islet between Frangé and Pain de Sucre, bearing  $141^{\circ}$  true, as in view; or Toque in line with the latter, bearing  $139^{\circ}$  true, leads in the fairway above Toque island.



(e)

South extreme of Chenal island open of south extreme of Repos island, bearing  $237^{\circ}$  true, leads up Hamelin channel from abreast Potchinelle island to Repos island.

*Charts 1169, 1965. Var. 1° 20' E.*

**PORT COURBET or HONGAI BAY.—Hamelin channel.—Depths.—Buoyage.**—The deepest channel to Port Courbet is the Hamelin, which connects with Henriette channel eastward of Index island, and has a not less depth than 15 feet at low water, springs, except between Lionne islet, 217 feet high, and Toque islet, where the depth is 12 feet. From Index island it leads south-eastward of Tourelle and of Casemate islets north-east of it, westward of Frangé islet, 174 feet high, and Toque islet, 85 feet high, between Porte-fanal, 89 feet high, and Polichinelle, and southward of Lionne, Campement, Repos, and Chenal islands. (*See views of the several reaches abreast.*)

The only known sunken dangers are a rock, with  $1\frac{1}{2}$  feet water situated about 3 cables  $234^\circ$  true from the south end of Tourelle island, and a rock which dries 2 feet, situated on the north side of the fairway, at about a cable south-eastward of the south-east end of Campement island, about a mile below the bar; by keeping close to the north side of Encrier the latter will be avoided.

The bar southward of Repos and Chenal islands has been dredged to 15 feet at low water, over a breadth of 40 yards, and its south side is marked by black buoys with cylindrical topmarks, which should be passed at a distance of 50 yards. Above Chenal island, 436 feet in height, the water deepens to 6, 8, and 10 fathoms in Kua Luk, the entrance to Port Courbet.

**Tides** (*see page 283*).—The flood stream in Hamelin channel ceases about 3 hours before high water (tide and half tide); the maximum rate of the streams is about one knot.

**Entrance** (*Lat.  $20^\circ 57\frac{1}{2}'$  N., Long.  $107^\circ 3'$  E.*).—Kua Luk, the entrance to Port Courbet, is about 2 cables wide, with depths of 9 to 10 fathoms, but at a mile to the northward the bay is all dry at low water, and there are extensive banks dry at low water on either side within the entrance.

**Anchorage.**—Vessels should anchor inside the entrance at about 4 cables westward of Bayard island, in from 6 to 8 fathoms, or outside, in Kua Luk, south-west of the settlement, in from 7 to 10 fathoms, and not in the narrow entrance, as the tidal streams are very strong there; the bottom is mud.

The fort on the west point of the entrance, Mount Buisson (*Lat.  $20^\circ 58'$  N., Long.  $107^\circ 3'$  E.*), and Jaune hill on the eastern side of the bay are conspicuous objects.

**Coal mines.**—The Mines river, on the eastern side of the port, is only practicable for boats for about a mile up. The Nagot Na or Hatsu coal mines are situated about 3 to 4 miles up this river, connected with the coaling wharf at Hongai by a tramway. The output from the mines was about 267,333 tons in the year 1903; the coal was said to be of good quality.

*General charts 2062, 2661a.*

*Chart 1169, 1965. Var. 1° 20' E.*

About 60 Europeans are employed here in connection with the mines, and there is a club, post office, telegraph office, Custom house, &c.

**Supplies. — Coal. — Wharves.** — There are two coaling wharves at Hongai, east side of entrance to the port, each 270 feet in length, with a depth of 22 feet alongside at low water springs. These wharves are provided with hydraulic and motor cranes, and from 100 to 200 tons of coal an hour can be delivered to vessels alongside; the trucks run on to the wharves. Vessels in the roadstead can be coaled by steam and other lighters at the rate of 50 tons an hour.

Slaughtered and live stock, poultry, game, vegetables, fruit, and fish can be procured at Hongai. Water is scarce, but can be obtained of good quality through the Chinese, who bring it from the river northward of Mines river in native craft; the process of watering, however, is tedious.

**Repairs.** — There is a workshop here with forges, foundries, and fitting shops, and the repairing of ships is undertaken.

**Communication.** — There is postal and telegraphic communication with other ports in Indo-China, and there is regular steamer communication with Haifong three times a week, 6 hours' journey, by the inland waterways.

**FAI TSI LONG BAY** is the largest bay of the archipelago, but on account of its distance from the delta of the Song Ka is not of so much importance as Ha Long bay: it is more a thoroughfare to the channels within the islands which afford smooth water to craft with local knowledge proceeding up or down the coast; there are no hidden dangers known in the bay itself.

The bay is accessible from Ha Long bay by the Ducouëdic and Chateau Renaud channels; from seaward by the Henriette viâ the Ducouëdic, and by the Aspic, Casque, and Mouche channels. Vessels of moderate draught can proceed to within 4 miles of Port Kamfa by the three last mentioned; the Henriette has been described.

**Ducouëdic channel** is the deepest channel from Henriette pass and Ha Long bay to Fai Tsi Long bay. It has a least depth of about 4 fathoms at low water, by following the pecked line, but there is less on entering the bay, northward of Entrée islet, about  $3\frac{1}{2}$  fathoms, and there is still less water in the Chateau Renaud, its continuation eastward.

It connects with Henriette pass between Sac island and Noisette islet, 121 feet high, half a mile westward of it (*Lat. 20° 50 $\frac{3}{4}$ ' N., Long. 107° 8' E.*); there are only two known dangers in it, namely, Sampan rock, which dries 11 feet, and may be avoided by keeping Echelle island open westward of Sac island, bearing 196° true, and a

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

rock which dries 9 feet, bearing 232° true, distant 4 cables, from Entrée island, in the northern part, which is avoided by keeping Kepi island open westward of Enclume rock, bearing 38° true. The 3-fathoms patch north of the west end of Commune island should be given a berth; the west extreme of Sac isle in line with the east extreme of Oiseau islet (the islet west of Commune island), bearing 196° true, leads westward of it. There is a channel on either side of Enclume rock (above water) and of Kepi island.

**Chateau Renaud channel** is the continuation north-eastward of Ducouëdic channel, and is the inshore channel through Fai Tsi Long bay north-eastward. It carries about 16 feet at low water into the Bourayne channel. The only sunken danger is a rock which dries 3 feet, situated on the bar with 16 feet least water, distant 7 cables, 70° true, from Dome island, and 2 cables distant from the island south of it; it is avoided by keeping the latter island close aboard; the water is then deeper until the bar, with 3 fathoms of water, is reached, eastward of Aigle island; from thence the vessel passes into Bourayne channel, page 293.

**ASPIC PASS** is straight, about 5 miles in length, and with a depth of 3½ fathoms at low water (but deeper elsewhere) on the pecked line eastward of Escargot (*Lat. 20° 53' N., Long. 107° 14' E.*), the inner island, which depth, however, is ample for all vessels likely to enter.

Approaching from the south-westward, and being off South-east islet of Henriette channel, that island should be gradually brought in line with Sam poni tsao (False Ninepin), 211° true astern, which will lead to the entrance of the pass, westward of Mere island, Enfant rock and of Arche islet. From abreast Mere islet, Escargot island will be seen between Pont island and the islet westward of it, bearing 9° true (view *a*, page 292), which being steered for will lead up the fairway of the pass clear of danger, into Saone channel, the eastern part of Fai Tsi Long bay, with deeper water, about 6 fathoms; thence by Bourayne channel if bound north-eastward, or anchoring in 7 or 9 fathoms eastward of Milieu island if requisite. The tidal streams are very strong in Aspic pass, abreast Pont island, where the channel is only a cable in breadth.

The Brandon channel leads from the Aspic to the Ducouëdic channel, with not less than 16 feet water on the pecked line, and thence to Ha Long bay or Fai Tsi Long bay.

Pluvier pass is entered from seaward westward of Aspic pass, continuing into Brandon channel; its southern branch, the Vaico pass, leads into the Ducouëdic.

**CASQUE PASS** and Mouche pass have a common approach, which is between Entrée island (*Lat. 20° 50' N., Long. 107° 14½' E.*)

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

on the west and Deux Passes and other islands lying off Danh do la island on the east. The only known dangers are a rocky patch of 3 feet, situated near the east side of the fairway, at 4 cables 209° true of Haute island; a rocky ridge with one head dry 6 feet at low water, which extends from off the north-east point of Entrée island to Verte island northward of it; and a patch of  $4\frac{1}{4}$  fathoms close to the west side of fairway, north-east of Verte island.

Sam poni tsao or False Ninepin bearing 226° true, astern, leads to off the entrance, about  $1\frac{1}{4}$  miles southward of Entrée island; and when Mouche rock, which is low, is seen just open of the east end of Deux Passes island, bearing 10° true (view *b* abreast), steer for it on that bearing (or the rock may be shut in again), which leads westward of the 3-foot patch and to the junction of Casque and Mouche passes.

Casque pass is straight and available, as far as draught is concerned, for all classes of vessels. Casque island, seen between the islands on either side of the channel, bearing 313° true (view *c* abreast), leads up clear of danger. When at about half a mile from that island, edge to the eastward to pass midway between it and the islands to the eastward, to avoid the  $3\frac{1}{4}$ -fathoms bank southward of the Casque; thence into Saône channel in deep water. A  $4\frac{1}{4}$ -fathoms patch lies close westward of the fairway 2 cables east-north-eastward of Verte island.

**Mouche pass** is also deep and straight, but the tidal streams are very strong, especially abreast the south end of Biches island, and the Casque is preferable. From the junction with the Casque at Deux Passes island, steer to pass between that island (*Lat. 20° 51' N., Long. 107° 18½' E.*) and the one eastward of it, and also eastward of Mouche rock. Then, steer with the rock in line with the east extreme of Deux Passes island, astern, until the summit of Aigle island is touching the north-west extreme of the narrow island forming the north-east end of the pass, bearing 345° true (view *d* abreast), which leads up the fairway; thence keep the western shore aboard into Saone channel.

### **INSHORE CHANNELS from Fai Tsi Long bay.—**

**General remarks.**—There are several channels leading along shore north-eastward from Fai Tsi Long bay for a distance of about 30 miles, to the Kua Mo. About midway is Colosse island, 738 feet in height, upon which the channels converge.

The depths on the several bars are not anywhere less than 14 feet at low water springs, but the Bruyères pass which leads to sea, viâ the Tsieng Mun and the bar from the in-shore route to the Kua Mo, have only the depth mentioned. The in-shore route can be resumed by entering the Ko Kai Mun, 3 miles eastward of the Kua Mo, for a

*General charts 2062, 2661a.*

# Leading marks for Aspic, Casque, and Mouche Passes.

Leading mark for Aspic Pass.



(a)

*L'Escargot.*

L'Escargot, bearing  $9^{\circ}$  true, between two islands in the pass, leads up from abreast Arche Islet in the entrance.

Approach to Casque and Mouche Passes.



(b)

*Entree I.*

*Parseval I.*

*Deux Passes I.*

*Mouche Rk.*

*Haute I*

Mouche Rock in line with east extreme of Deux Passes Island, bearing  $10^{\circ}$  true, leads to Deux Passes I.

Leading mark up Casque Pass.



(c)

*Marsouin.*

*Casque I.*

Casque Island, bearing  $313^{\circ}$  true, leads up the fairway from abreast Deux Passes Island.

Leading mark up Mouche Pass.



(d)

*Fouachu summit. L'Aigle summit.*

L'Aigle summit just open, bearing  $345^{\circ}$  true leads in the fairway above Parseval Island.







# Inshore channels.

## Leading marks for the fairways.

### Bourayne channel.



*Dent I. Pouce I.*

Pouce islet in line with south side of Dent islet, bearing  $61^{\circ}$  true, leads through Bourayne channel.

### Roc aux Aigles channel.



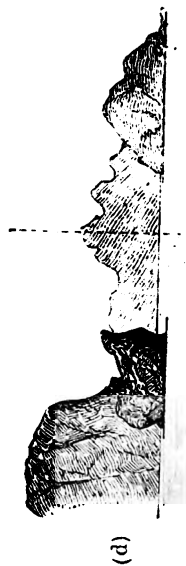
Summit of Roc aux Aigles bearing  $65^{\circ}$  true, in line with north side of Coin islet, leads northward of Boisé island reef, until Broche island bears East.

### Lynx channel.



North extreme of Castel island in line with east extreme of Chat island, bearing  $45^{\circ}$  true, leads eastward of Echelle reef.

### Lynx channel.



*Chat I. Colosse I. Coude I.*

Summit of Colosse island midway between Chat and Coude islands, bearing  $221^{\circ}$  true, astern, leads between Lynx and Diadème rocks.

### Pak ha mun to Surprise channel.



*Cone. Gourde.*

Leading mark from abreast Pirate bay.—Cone islet summit just open westward of Gourde islet, bearing  $365^{\circ}$  true.

*Charts 1169, 1965. Var. 1° 20' E.*

further distance of about 25 miles, within Grand Singe, Chateau Renaud, and Tsieng Mui islands, emerging at Kua Tam eastward of the last-mentioned island.

The sunken dangers are very few, steep-to islands generally forming the channels, but the tidal streams are strong in the narrow portions. This route offers considerable advantages during the north-east monsoon period for light-draught or small-powered steamers, but it is not recommended to those without local knowledge or without the assistance of a pilot. The rise of tide at springs is from 12 to 14 feet. The tracks to be followed are marked by pecked lines which will afford better information than any written description. The following are the principal channels:—

**Saone and Bourayne channels.**—Vessels of moderate draught can reach Saone channel and the Bourayne, its continuation eastward, from sea by the Aspique, Casque, and Mouche passes, before described, and deeper vessels could enter by the Casque with a good pilot; and there is good anchorage in depths of 5 to 10 fathoms in them. The Bourayne is the approach to Port Kamfa; Pouce islet, touching the south side of Dent island, bearing 61° true, leads through it. *See view a* abreast.

At one mile eastward of Dent island is a bar with 14 feet at low water, leading into Kersaint channel.

**Kersaint channel**, leading from Saone channel southward of Bourayne channel and close northward of Roussé island, has about 3½ fathoms over a bar near the centre of that island, and in other places from 6 to 8 fathoms. It is free from sunken dangers other than a rock which nearly covers at the highest springs, situated 6 cables northward of Dome island (442 feet in height, *Lat. 21° 0' N., Long. 107° 24' E.*), eastward of the fairway and near its junction with the Bourayne channel.

**Roc aux Aigles channel**, southward of Roussé island, also leads eastward from Saone channel, and nearly parallel to the north coast of Longue island. The shoalest water is over the bar half a mile in length, situated about a mile westward of Roc aux Aigles, a rocky mass 672 feet in height on the north coast of Longue island, and one of the most conspicuous objects in the archipelago. The only danger is the sunken rock on the bank which extends north-eastward of Boisé island (*Lat. 20° 55' N., Long. 107° 21' E.*), westward of Moustique rock; it will be avoided by keeping the Roc aux Aigles summit in line with the north side of Coin islet, bearing 65° true (*view b* abreast), until Brioche island bears 92° true.

**Carabine channel** is the continuation north-eastward of the Roc aux Aigles channel; it leads to sea through Surprise channel and

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

Kua Doi or Pak ha mun pass in not less than  $3\frac{1}{2}$  fathoms water. The only dangers are, the rock, with 2 feet water, situated  $2\frac{1}{4}$  cables,  $230^\circ$  true, from Meurtriére island, on the edge of the 3-fathoms contour, and the shallow bank, situated  $1\frac{3}{4}$  cables southward of Touffe island; the latter will be avoided by keeping close to the island.

**Port des Sylphes.**—Lutin channel, southward of Longue island may be entered at either end of that island; it has an entrance from the southward, between the Koan Lan group, between Loutres point and Dao Trao island. It has not been properly surveyed.

On its southern side is Port des Sylphes, the western entrance of which is very narrow, with a depth of 16 feet in it, close to the northern shore. Its northern entrance has about 10 feet water. There are depths apparently of 2 to 4 fathoms in the port.

In the north-east part is a path leading to the principal village on Table island; its existence was for a long time unknown, and it formerly was a pirate haunt.

**KAMFA PORT and channel.**—Vessels of any draught, with a good pilot, can approach Kamfa from the sea by Casque pass, as far as Bourayne channel, about 3 miles from the entrance to the port; lighter draughts may approach by several of the passes before described.

Kamfa channel, in the entrance of which is Port Kamfa, leads to Tien yen, distant about 16 miles, and is available for small steam craft towards high water; thence it leads to sea by the Kua Mo.

The entrance to the port is about a mile wide, but is nearly all occupied by Jaune and Parseval islands. The entrance points are fronted by spits mostly dry at low water to the distance of  $3\frac{1}{2}$  miles to the southward, to Bourayne channel, between which is a narrow channel with  $3\frac{3}{4}$  fathoms at low water. Eastward of Jaune island there is but  $3\frac{1}{4}$  fathoms in the channel, but above it deepens to 6 and 8 fathoms abreast Parseval island, being again reduced to  $3\frac{1}{4}$  fathoms northward of that island; farther up there is anchorage in a depth of 4 to 5 fathoms, good holding ground.

The passage westward of Jaune and Parseval islands is shallow, only about one fathom at low water.

**Directions.**—From Bourayne channel the course is close along Angle islet and the islets southward of it, until the whole of Jaune island is open of Sud de la Pass point, when Jaune island bearing  $3^\circ$  true will lead up the fairway. From abreast Sud de la Pass point, steer midway between Jaune and Verte islands, avoiding the reefs extending southward from both. If proceeding above Parseval island, care must be taken in passing between the reef extending from that island and the rock which dries 8 feet abreast it.

The anchorage of Kamfa being of small extent diminishes the im-

*General charts 2062, 2661a.*

*Charts 1169, 1965. Var. 1° 20' E.*

portance which it might have if the outcrop of coal which is visible in many places on the surface should prove rich enough for being worked extensively, and to call for the construction of wharves.

*Charts 776, 1169.*

**INNER CHANNELS.—From Colosse island eastward** (*Lat. 21° 1' N., Long. 107° 26' E.*).—

**Duchaffaut channel** is the continuation north-eastward of the Bourayne and Kersaint channels; it is straight, easily navigated, and has a bar with 3 fathoms at low water over it, between Doigt and Echelle islets (*Lat. 21° 4' N., Long. 107° 27½' E.*), but there is scarcely better water in the fairway beyond until near its junction with the Lynx channel at Donjon island. There is only a depth of 14 feet over the bars giving access to the sea to the north-eastward as mentioned in the general remarks, page 292.

**Lynx channel** is the continuation northward of Roc aux Aigles; it has a bar with 3 fathoms at low water north-eastward of Colosse island (738 feet high). The principal dangers are Echelle rock, in lat. 21° 4' N., long. 107° 27½' E., which dries 6 feet, on the west side of fairway, between Echelle and Saone islands; and Lynx rock, having less than 6 feet water, 2½ miles north-eastward of it, on the west side of fairway, with Diadème rock of 2½ fathoms abreast on the east side of fairway, both lying between Lion and Diadème islands.

The north side of Castel island, in line with the south side of Chat island, bearing 45° true, leads eastward of Echelle rock (view *c*, on page 293), and the summit of Colosse island seen midway between Coude and Chat islands, bearing 221° true (astern) leads between Lynx and Diadème rocks (view *d* on page 293).

About 2 miles north-eastward, the Lynx connects with the other channels at Donjon island.

**Kebao** (*Lat. 21° 8' N., Long. 107° 29' E.*), an inlet in the inshore channel, situated about 8½ miles north-eastward of Port Kamfa, acquired importance from the coal mines found at that place, but it has not proved profitable. There is still an agent of the Company at Port Wallut, on the south shore of the Kua Mo, southward of Pirate's island, distant about 6 miles. Chinese coolies are working at the mines, but there is not much being done apparently. (*Chart 1965.*)

*Plan of Pak hu mun on 1169; charts 1169, 1965. Var. 1° 15' E.*

**PAK HA MUN or Kua Doi.**—This pass, situated in lat. 20° 58' N., long. 107° 32½' E., near the centre of the sea-face of Fai Tsi Long archipelago, affords access to the Inner route by Surprise and Carabine channels.

The island forming the eastern shore is high and completely wooded, whilst that to the westward presents grassy slopes, topped by clumps

*General charts 2062, 2661a.*

*Plan of Pak hu mun on 1169; charts 1169, 1965. Var. 1° 15' E.*

of trees. The western shore is shallow to a line joining the west point of entrance to the Fer-à-Cheval, a group of rocks rendered conspicuous by the sandy shore behind them.

**Directions.—Anchorage.**—Its entrance is about 3 cables wide between Entrée and Bosse peaks, and may be distinguished by Mount Pak ha mun, 1,302 feet in height, directly within it, and by Table mount, 1,444 feet in height, about  $2\frac{1}{2}$  miles to the southward of the former. There are depths of 6 to 7 fathoms in the approach, and there are no known dangers; in the entrance the water is much deeper, but a short distance within it is reduced to about 7 fathoms, and here there is good anchorage. Mount Pak ha mun, bearing  $314^\circ$  true, leads in through the entrance, from whence the eastern shore should be kept, anchoring when Bosse peak bears  $86^\circ$  true.

Better shelter, however, is obtained by keeping along the eastern shore to abreast Pirate bay, where there is anchorage in about 4 fathoms. The anchorage is secure here even during typhoons, but the tidal stream runs with considerable strength. The Middle ground, about  $1\frac{1}{2}$  miles in length, with as little as 2 feet in places, occupies the greater portion of the channel.

Proceeding northward from Pirate bay, abreast Nord bay, is the junction of Surprise channel with the Carabine channel, which leads to the inshore channels. By keeping the summit of Cone island just open of the west side of Gourde island, bearing  $358^\circ$  true (view *c*, on page 293), a vessel will be in the fairway marked by the pecked line; when about half a mile from the latter island, steer to pass about a cable eastward of it; thence by the pecked line for Carabine channel (page 293), or as requisite through Surprise channel.

**Tides.**—*See* page 297.

**Supplies.**—Water is obtainable in Pirate bay; oysters and game are abundant, and fish is procurable from the fishermen.

**Surprise channel** leads from Pak ha mun north-eastward to Tsien Mun and Bruyères pass, and has apparently not less than 3 fathoms in the fairway. A patch with  $2\frac{3}{4}$  fathoms lies 4 cables south-east of the south point of Noire island.

**Madeleine** is the name of the large island which separates Surprise channel from the Lynx and others in-shore.

**Jaguar channel** leads from Pak ha mun south-westward, between Table and Koan Lan islands. It is only available for very light draughts, and its western end leads into the shallow space between the Koan Lan group, and from thence into Lutin channel to the north and to sea to the southward; it is of no importance. Near

*General charts 2062, 2661a.*

*Plan of Pak hu mun on 1169; charts 1169, 1965. Var. 1° 15' E.*

its centre, abreast La Tortue island, it is nearly closed by ledges from both shores, with rocks above water on them, that on the northern side being named Robinson rock.

*Charts 776, 1965. Var. 1° 10' E.*

**COAST.—General remarks.**—The Fai Tsi Long archipelago may be said to end near the Pak ha mun entrance. From this point northward to Cape Pak Lung, the curiously-shaped rocks of the archipelago are succeeded by hills covered with trees and dense jungle, extending to the shore. Inland are mountains ranging from 4,000 to 5,000 feet in height, only visible in clear weather, whilst at varying distances from the shore are long and narrow islands, ranging from 400 to 500 feet in height and lying parallel to the shore, within which is a smooth water channel similar to that through the archipelago, and affording also well-sheltered anchorages. Mention of this has also been made on page 292.

**Fogs** are more frequent at the end of the north-east monsoon on this coast than in the Fai Tsi Long archipelago.

**Tides.**—The range of the tide increases towards the north-east. From 14 feet at springs at Kebao, it attains to 16½ feet at Tsieng Mui point, Pak Lung, and Pakhoi. The tidal streams are stronger, more especially in the narrow passages between the islands. Slack stream corresponds nearly with high and low water, the flood setting north-eastward and the ebb south, at about 2 knots in the offing, except at Kebao, where the stream runs north-eastward for about 4 hours before low water to 3 or 4 hours after low water.

At Tsieng Mui island, Kua Tam entrance, it is stated to be high water at full and change one hour in advance of Do Son, or at 4h. At neaps there are two high waters in the 24 hours, with a rise of about 6½ feet, but very irregular. See the "Table des Marees des Colonies Francaises des Mers de Chine."

**TSIENG MUN** (*Lat. 21° 8' N., Long. 107° 38' E.*) entrance to the Inshore passages, is situated about 10 miles northward of Pak ha mun, and westward of the Kao Tao islands.

Its entrance is about three-quarters of a mile wide between Tsieng Mun point and Boisée island, with a depth of 8 to 10 fathoms, with good holding ground a short distance within, in the same depths. Vessels of light draught can proceed farther in to Surprise channel, and find more complete shelter.

The deepest approach is from the southward, close along Ba Mun island, where the depth is apparently from 6 to 7 fathoms within the dangers westward of the off-lying islands; the approach northward of the island is over a bank with depths of 3½ to 5 fathoms.

*General charts 2062, 2661a.*

*Charts 776, 1966. Var. 1° E.*

**Dangers.**—Hugon rock, with  $1\frac{1}{2}$  fathoms water, lies half a mile  $114^\circ$  true of the south point of Sanglier island, on the north side of the approach. A bank with less than 6 feet is charted bearing  $178^\circ$  true,  $4\frac{1}{2}$  miles; a sandbank, with rocky heads of  $1\frac{1}{2}$  fathoms,  $136^\circ$  true, distant  $2\frac{3}{4}$  miles, and another of same depth (P.D.)  $114^\circ$  true, distant  $4\frac{1}{2}$  miles, all from the south point of Sanglier island. Other dangers may exist, as the ground has not been thoroughly examined.

**Bruyères pass** (*Lat.  $21^\circ 9\frac{1}{2}' N.$ , Long.  $107^\circ 34\frac{1}{4}' E.$* ) leads from Tsieng Mun to the Inshore channels to Kebao, &c. It lies between Bruyères island and the extensive banks eastward of it, has a depth of 14 feet at low water, and 29 feet at high water springs over its bar, the mark for which is the north extreme of Tsieng Mun rock midway between Tsieng Mun point and the remarkable tree within it, bearing  $129^\circ$  true. The north extreme of the rock must be kept in line with the tree, bearing  $136^\circ$  true, to clear the reef extending northward of Bruyères island (*see views a and b abreast*). A vessel must be prepared to meet a strong tidal stream when abreast the island.

**Little Tsieng Mun** is the narrow passage between Boisée and Sanglier or Tsieng san island, north side of the Tsieng Mun, and is of no importance.

**Little Kuai Shin Mun** is the channel between the north end of Sanglier island and Singes island; the depths in the seaward approach are not above 3 fathoms, but there are depths of 10 fathoms in the pass, shoaling again to less than 4 fathoms abreast Marble rock, abreast which is a patch of  $2\frac{1}{2}$  fathoms in the fairway; it is probably never used, as there is no advantage in doing so.

**From Bruyères island, southward**, the in-shore channels, Duchaffaut and Lynx, lead to Kebao, Port Kamfa, &c., as previously described.

**From Bruyères island, northward**, the in-shore channel is barred by a bank which connects Longue island with the south point of entrance to the Kua Mo, over which is a depth of about 14 feet at low water, or the same as in Bruyères pass. This bar, though narrow, is composed of sand and gravel, unlike the bars in the Fai Tsi Long archipelago, which are of mud. The half-wooded summit of Grand Singe island in line with the east extreme of Plage island, bearing  $38^\circ$  true, leads over it in the best water. *View c abreast.*

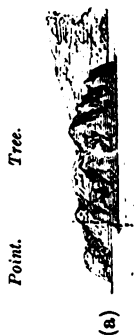
**The KAO TAO ISLANDS** are a cluster of bare islands situated in the approach to Tsieng Mun, and from 7 to 14 miles off-shore. They occupy a space about 15 miles in length in a north-east and south-west direction, and about half that distance in breadth; the spaces between the islands are mostly encumbered with dangers,

*General charts 2062, 2661a.*

# Inshore channels.

## Bruyères pass and Kua Mo point bar.

### Bruyères pass.



North extreme of Tsien Mun rock midway between Tsien point and the remarkable tree within it, bearing  $129^{\circ}$  true.



*Tsien Mun Pt.*  
The north extreme of Tsien Mun rock in line with the remarkable tree within. Tsien Mun point, bearing  $138^{\circ}$  true, leads through fairway of north entrance of the pass.

*Tsien Mun rock.*

### Kua Mo point bar.



### Plate I. Grand Singe I.

The partly-wooded summit of Grand Singe I. in line with the east extreme of Plate I., bearing  $38^{\circ}$  true leads over the bar from Inshore channel to Kua Mo.





*Charts 776, 1965. Var. 1° E.*

for which *see* the charts. The islands are almost denuded of trees, which serves to distinguish them from the group off Cape Koan Loan, which are thickly wooded.

*Chart 1965.*

**Shum Lan Shan**, the largest and easternmost islet, is 5 miles in length by about  $1\frac{1}{2}$  miles in breadth, and 650 feet in height. Its southern extreme is composed of red steep cliffs. Smaller islands lie near its extremes and within it.

**Sha Pak Wan** is an irregularly-shaped island  $3\frac{1}{2}$  miles in length, with a cone summit 552 feet in height on its northern end in lat.  $21^{\circ} 1' N.$ , long.  $107^{\circ} 43\frac{1}{2}' E.$  The southern portion is composed of red cliffs about 100 feet high, and is connected with the northern end by a low isthmus. Dangers extend 2 miles or more westward of this island, the limit of which has not been defined. *See* Anchorage, below.

**Uli pai reef** lies about  $2\frac{1}{2}$  miles north-west of Sha Pak Wan, and dries at low water. The dangers between this reef and Tsieng Mun have been previously mentioned.

**Afo shao.**—Other islands of the southern group are Afo shao, 335 feet high, westward of Shum Lan shan, with Katoi sha, 210 feet high between, and Lui shao, 207 feet high, northward of Afo shao.

*Charts 776, 1965.*

Tankan shao, 309 feet high, lies between Lui shao and Tshim shan before mentioned.

**Caution.**—There are many reefs and rocks above and below water, as charted, and it is advisable not to venture among them.

**Mashao and Tshim shan**, 296 feet and 466 feet in height, respectively, the latter with a cone summit, are the north-easternmost of the group. Patches of  $5\frac{1}{2}$  fathoms are charted between these islands and Lo shu shan islands, with depths of 9 to 10 fathoms in their vicinity; shoaler water may exist.

**Anchorage.**—There is anchorage for vessels of about 15 feet draught in Sha Pak Wan anchorage, the space between Shum Lan Shan and Sha Pak Wan. The south entrance is about half a mile wide between the reefs extending from the islets on either side, with a depth of 5 fathoms, decreasing within to 4 fathoms. A rock nearly awash at low water lies on the extreme of the flat, which extends about 2 cables westward of the islet on the eastern side; and a patch of  $1\frac{1}{2}$  fathoms lies in the fairway, about a mile within the entrance. The anchorage is northward of this patch, in about 4 fathoms, sheltered from northerly winds, but is open to the wind and swell from

*General charts 2062, 2661a.*

*Charts 776, 1965. Var. 1° E.*

the southward. Vessels could, however, cross the bar, which has about 3 fathoms at low water, northward of the anchorage, and anchor in about 4 fathoms, and could leave that way, passing out westward of Katoï sha island.

The islands were formerly but little inhabited on account of the incursions of pirates, who destroyed the houses and crops. Since they came under French protection, the islands have been well cultivated, and salt from the lagoon, in the south-west island, forms an article of export. There is a landing place on the beach here, and on a mound is the residence of a European, who has a detachment of soldiers.

**Tides.**—It is high water, full and change, at about 7h.; springs rise 13 feet. *See note on chart 776.*

**LO SHU SHAN ISLANDS.**—This group, consisting of three islands and several rocks, are situated about 7 miles north-eastward of the Kai Tao group, and about the same distance southward of Tsieng Mun island.

Lo shu shan is inhabited by Chinese; during the fishing season fishing craft from Pak hoi often seek shelter here during the night.

**Lo shu shan** (*Lat. 21° 14½' N., Long. 107° 56½' E.*), the largest and northernmost islet of the group, is 2 miles in length, east and west, one mile in breadth, and 614 feet in height near the centre. The north shore is foul to the distance of nearly a mile, there being a patch of 7 feet at 8 cables off the centre of the north shore.

The eastern shore is foul to the distance of about 6 cables. Pluvier bank, awash at low water, is situated near the extreme, with a reef which dries 4 feet at half a mile north of it. Rocks uncovered at half tide lie off the north-east point, with Pyramid rock, 59 feet high, close to the point. Ledges, dry in places, extend half a mile off the south-east point.

A shoal with from 3½ to 5 fathoms extends beyond these ledges to a distance of 1½ miles south-eastward from the point, with depths of 6 to 8 fathoms between it and Im shan.

**Anchorage.**—There is anchorage in about 6 fathoms, sand and mud, with tolerable shelter during the north-east monsoon, under Rat point, the south-west extreme of the island, avoiding the patch of 4½ fathoms situated about 2 cables off the shore.

**Im shan**, the centre island, lies 2½ miles south-east of Lo shu shan. It is about one-third of a mile in extent, 207 feet in height, with an islet 148 feet in height near its west point. It is surrounded by foul ground to the distance of about 2 cables, and a reef which dries 8 feet lies 4 cables 102° true of its south extreme. About

*General charts 2062, 2661a.*

*Charts 776, 1965. Var. 1° E.*

2 cables farther eastward is a group of rocks always above water, and which serve as a guard to the reef.

**Tai chan tao**, about 6 cables in extent, and 453 feet in height, lies about 3 cables southward of Im shan, with a depth of 6 fathoms between. Except for a short distance off its north-west side it is free from danger. West rock, 30 feet high, lies half a mile westward of it.

**Sam ha pai** is a reef about 2 cables in extent, with three heads dry at low water springs, the highest being then 3 feet above water. It lies 66° true, distant  $5\frac{1}{2}$  miles from Pyramid rock, Lo shu shan.

Breakers have been reported one mile southward of the reef. The west extreme of Tai chan tao in line with or shut in with the east extreme of Im shan leads westward of these dangers.

### COAST.—KUA MO APPROACH.—Outlying shoals.

—Within the Kao Tao and Lao shu shan islands is the Kuai Shin Mun, a channel nearly 2 miles wide, between Singes and Cigales islands, leading to Kua Mo, the approach to Tien yen, and to Ko Kai Mun, the continuation of the Inner route north-eastward.

Within the 5-fathoms contour line, which lies  $5\frac{1}{2}$  miles seaward of Singes island and of the islands north-eastward of it, or for about half-way towards the off-lying islands, are numerous patches with depths of  $1\frac{1}{2}$  to 3 fathoms, one of which, with  $2\frac{1}{4}$  fathoms, situated about 7 miles 76° true of the north extreme of Singes island, is named Clocheterie bank (*Lat. 21° 15½' N., Long. 107° 45¼' E.*).

A sand patch  $1\frac{1}{2}$  cables in extent, with a depth of  $1\frac{1}{2}$  fathoms, lies  $2\frac{1}{2}$  miles south-westward of Clocheterie bank, with the northern point of Singes island bearing 265° true, distant  $4\frac{7}{10}$  miles.

A patch of  $1\frac{3}{4}$  fathoms lies with the north extreme of Singes island bearing 295° true, distant 4 miles. On a bank with less than 3 fathoms nearer the shore are patches of  $1\frac{1}{4}$  and 2 fathoms, as charted.

The chart will afford the best information on the position of these shoals; others may exist.

**KUA MO and Tien Yen road.**—Kua Mo (*Lat. 21° 13½' N., Long. 107° 35' E.*) is about half a mile wide between Verte island and the point of the peninsula forming its south point, with a depth of 9 to 10 fathoms, shoaling gradually within to 5 and 6 fathoms westward of Pirates island and in Tien Yen road above it. Abreast Pirates island the deep channel is but 2 cables wide, there being a bank about one mile in length, with depths of 5 to 9 feet, forming the north side of the fairway.

*General charts 2062, 2661a, 1263.*

*Charts 776, 1965. Var. 1° E.*

**Directions.—Anchorages.**—The Kua Mo is entered from seaward through the Kuai Shin Mun, the approach to which is over the bank before mentioned, in depths of about 3 fathoms at low water springs, and  $5\frac{1}{2}$  fathoms at high water springs, avoiding the patches of less water shown on the chart. The summit of Deux Chaines island in line with the north extreme of Singes island bearing about  $283^\circ$  true, apparently leads in the best water, but this information is derived only from the chart. Round the north point of Singes island at the distance of about half a mile, to avoid the ledge extending 2 cables off it, thence steer direct for Kua Mo, southward of Verte island, within which the north side of Pirates island should be kept aboard; Verte island touching the north end of Pirates island leads between Pirates island and the Middle bank. When the south end of Pirates island bears  $91^\circ$  true, steer  $271^\circ$  true, anchoring in 5 to 6 fathoms, good holding ground of sand and mud, when the island is distant nearly a mile. The banks in the river are covered with fishing stakes at times.

There is not less water for 3 miles farther north-westward, in Tien Yen road; above this it is shallow and intricate.

**Tien Yen** (*Lat.  $21^\circ 18\frac{1}{2}'$  N., Long.  $107^\circ 24'$  E.*), about 11 miles above Pirates island, is apparently barely accessible for boats at low water; at spring tides, the streams run very strong, and are much increased during the rainy season. At the latter period the river is nothing but a torrent; in the dry season boats can scarcely ascend it, and they have to be dragged from one portion to another. Tien Yen is of military importance as commanding the road from Nui Ngok to Langson; it is connected with the telegraph system, and there is constant communication with Haifong, &c., by small craft.

Tien Yen has a market offering a few supplies; above, the country is fertile and picturesque.

**Anchorage.**—Pagoda point anchorage is the port of Tien Yen; it is frequented by the small craft which run to Haifong, Nui Ngok, &c., about three times a week. It should only be approached with local knowledge. The below-mentioned lights probably lead up the fairway; thence southward of the *white* light. See the anchorage westward of Coq point on chart 776.

**Lights.**—On Pagoda point pier, on the southern side of approach to Tien Yen river, a *fixed red* light is exhibited from a pole on a grey shed, at an elevation of 23 feet above high water; it is visible in clear weather from a distance of about 5 miles, when bearing from  $59^\circ$  true, through north and west, to  $239^\circ$  ( $180^\circ$ ).

A *fixed white* light is shown, from an iron pole with ball painted

*General charts 2062, 2661a.*

*Charts 776, 1965. Var. 1° E.*

red, on the shoal extending from Pagoda point; it is charted 9 cables east-south-eastward from the preceding light, is elevated 10 feet above high water, and can be seen from a distance of about 4 miles.

**Port Wallut** (*Lat. 21° 12½' N., Long. 107° 33½' E.*).—Within Kua Mo point, south side of the entrance, between it and Pirates island, is Port Wallut, formerly the coal depôt for the mines at Kebao, now but little worked, though there is an agent of the company here. There is a small wharf, to which the intended railway from the mines was to have connected. There is a Custom house on the north end of Pirates island. The port is connected with the telegraph system of Indo-China, and there is frequent communication by small craft with Haifong, &c. It affords no supplies.

The port is not recommended as an anchorage, as the tide runs strongly, and violent gusts of wind sweep through it; the depths are about 4 fathoms.

**IN-SHORE CHANNEL.**—Northward of the Kua Mo are the long and high islands named Deux Chaines, Grand Singe, Chateau Renaud, and Tsieng Mui, within which is a smooth-water channel during the north-east monsoon period for light-draught vessels. The entrance is at Ko Kai Mun, from whence it is about 23 miles to the Kua Tam, where vessels come out again. *See In-shore channels from Fai Tsi Long bay to the south-westward, page 292.*

**KO KAI MUN or Kua Van muk** is the continuation of the In-shore channel north-eastward from the Kua Mo, or for small vessels from the south-westward. It is about half a mile wide in the entrance, with depths of 7 to 8 fathoms, but the approach from seaward, over the off-shore bank, has not more than 3 fathoms at low water.

A reef of rocks, always above water, lies in the fairway 2½ cables south of the east point of entrance; the only known danger is a patch of 4 feet situated in the fairway, 2½ cables 272° true of the island with a bare summit, just within the north point of entrance.

**Directions.**—To enter, having passed half a mile northward of Singes island as for Kua Mo, steer for the west extreme of the island on the north side of entrance, bearing 319° true, in line with the left slope of a distant hill, until the south end of Cigales island is over the middle of the low rocks in the channel, which mark kept astern leads southward of the 4-feet patch; course may be altered for the anchorage in 7 to 8 fathoms, sand, when the west extreme of Tir island bears 311° true, or shaped northward for the In-shore channel, when the east extreme of the Two Brothers bears 40° true.

*General charts 2062, 2661a.*

*Charts 776, 1965. Var. 1° E.*

Mirmidon hill over the centre of the eastern island of the Two Brothers also leads westward of the 4-foot patch. If there is a strong southerly stream it is recommended to pass between the patch and the islet by hauling close round the latter.

**HO LAI MUN** (*Lat. 21° 18' N., Long. 107° 41' E.*) is the entrance to the in-shore channel eastward of Ko Kai Mun, between Grand Singe and Chateau Renaud islands; it is about 2 cables wide, with a depth of about 9 fathoms, but its approach is the same as for Ko Kai Mun and Kua Mo, over the bank fronting the shore with 3 fathoms water. The only dangers are a rock which dries at low water between the island on the south side of the approach and the west part of the entrance, and the rock which dries 2 feet 8½ cables eastward of it, and 131° true from the west end of Chateau Renaud island. The entrance bearing 330° true, with Garceau island seen through it, seems (from the chart) to lead midway between those dangers. Within the entrance there is good anchorage for small craft.

Proceeding north-eastward, the best water, about 12 feet, is close to Chateau Renaud island; a rock which dries 5 feet lies 4 cables from that island at 2½ miles north-eastward of its west extreme.

Chinese Cap, 623 feet in height, is a conspicuous island in the in-shore channel on the bank fronting the mainland. Fishing stakes will be seen on these banks.

*Chart 776, Tsieng Mun to Tra ko island.*

**FU TAI MUN** (*Lat. 21° 21' N., Long. 107° 48½' E.*) is the entrance between Chateau Renaud and Tsieng Mui islands; it is about 7 cables wide, with a depth of about 9 fathoms and good sheltered anchorage in 5 to 10 fathoms over an area of a mile in extent within. The south-western point of Tsieng Mui, east side of the entrance, is 558 feet in height.

The entrance is approached, like the other entrances, by a bank over which there is from 3 to 4 fathoms at low water; springs rise about 16 feet.

**Dangers.**—Clocheterie bank, before mentioned, with 2½ fathoms, and patches of 2¾ and 3 fathoms eastward of it, lie on the west side of the approach; a patch of 2¾ fathoms lies on the east side of approach, 4 miles 164° true from the hill over the east point of entrance. Eastward of a line joining the hill and the last-mentioned patch the water is shallow, 1½ to 2 fathoms; a rock which dries 8 feet lies 2 cables south-east of the inner east point of the entrance.

A patch of 3¼ fathoms lies near the fairway in the north end of the entrance, 3 cables from the west point.

*General charts 2062, 2661a.*

*Chart 776, Tsieng Mun to Tra ko island. Var. 1° E.*

**Directions.—Anchorage.**—The inner eastern point of the entrance bearing  $349^{\circ}$  true leads in over the bank fronting it, between the shallow banks, in about  $3\frac{1}{2}$  fathoms at low water; the approach, however, has not been closely sounded and other banks may possibly exist. The above mark should be steered for until within 4 cables of the point, when course should be altered to pass about 2 cables off, or midway between it and the  $3\frac{1}{4}$ -fathoms patch in the fairway. From abreast the point steer for Mirmidon hill (Nui Nghanh), (a bare summit rising above the mangroves to the north-westward), anchoring as requisite. Small craft may go as far northward as Verte island (Nui Soka), or beyond, in depths of 3 to 4 fathoms.

**Ak hoi** (*Lat.  $21^{\circ} 27' N.$ , Long.  $107^{\circ} 44' E.$* ), on the mainland, is situated about 6 miles from the anchorage just mentioned. Fishing stakes line the channel to this place, but they are constantly displaced, and a boat could only ascend to it with the assistance of a native towards high water apparently; there is a depth of a few feet water near the town, but outside it dries as charted.

Ak hoi is the most populous centre of the northern coast of Tong King; the inhabitants are principally Chinese; the Annamite village opposite it is very poor; the most convenient place for landing is near the limekilns below the town. The freshets in the river are less violent than in the Tien Yen during and after the summer rains, but the large boulders covering its bed testify to the rapidity of the stream at that time.

**The In-shore channel** eastward is close along Tsieng Mui island, and has not less than  $3\frac{1}{2}$  fathoms if the fairway be kept, but it is more difficult to do so here than to the westward, as it varies in its distance from the island; low water is the best time as the banks are more defined. The northern banks have numerous fishing stakes.

**Tsieng Mui island** is the easternmost island of those forming the in-shore channel; it is about 10 miles in length,  $1\frac{1}{2}$  miles in breadth, with a ridge of hills extending along its northern side for its whole length, attaining a height of 577 feet in Needle peak, distant  $2\frac{1}{2}$  miles from its eastern extreme. There are a few miserable villages on its eastern portion.

**KUA TAM** (*Lat.  $21^{\circ} 24' N.$ , Long.  $107^{\circ} 59' E.$* ) is the eastern entrance to the in-shore channel; it is about 2 cables wide between the banks on either side, with a depth of  $3\frac{3}{4}$  fathoms in the fairway, and there is about the same depth in the approach; the 5-fathoms line, however, is but one mile off-shore.

**Directions.—Anchorage.**—Arequier rock, about 65 feet in height, situated on a reef extending about 3 cables off Tsieng Mui, the

*General charts 2062, 2661a, 1263.*



*Chart 776, Tsieng Mun to Tra ko island. Var. 1° E.*

west point of the entrance, is a good mark. It may be steered for bearing about 1° true until within 3 or 4 cables of it, when course should be shaped to pass eastward of it at the distance of 1½ cables; haul to the westward as soon as within it, and give the point of the island a berth of 2 to 3 cables.

The swell penetrates a considerable distance during the north-east monsoon period and during the flood stream, rendering it advisable to anchor at about 2 miles within the entrance, where there are depths of 5 to 6 fathoms, as charted.

**Tides.**—Springs rise 16½ feet at the Kua Tam, *see* page 297.

**MONKAI RIVER** (*Lat. 21° 26' N., Long. 107° 56' E.*) lies northward of the Kua Tam anchorage and westward of Nui Ngok, 360 feet high, the west extreme of Tra Ko island; it can only be ascended by boats, with local knowledge; about 7 miles up is the village of the same name.

**Beacons.**—The fairway, leading to Monkai river from Arequier rock to Nui Ngok, is marked by pole beacons; the outer one is black, with a cylindrical topmark, and two others above are red, with conical topmarks. The outer part of the channel, marked by the black beacon, is liable to change, under the influence of gales of wind and strong tides; when necessary the position of the beacon is altered. Red beacons should be kept to starboard, and black beacons to port on entering.

**Communication.**—**Nui Ngok** settlement, at the south-west end of Tra ko island, is the eastern terminus of the Messageries Fluviales, which run from Haifong through the In-shore channel, calling at the several places en route about three times a week. It is connected with the telegraph system, and is important as being the French frontier station. Local supplies are obtainable. There is a Custom house.

*Charts 776 and 2062, Tong King gulf.*

**COAST.**—**Tra Ko island.**—The coast north-eastward of the Kua Tam is fronted by Tra Ko island, 7 miles in length by one mile in width, with a channel within it into which some of the mouths of Monkai river discharge. Towards the eastern end of the island is a Christian village and church.

*Chart 2062, Tong King gulf.*

The whole coast, to Cape Pak Lung is fronted by a shallow bank extending out to a line joining the cape to Tsieng Mui island.

**Shuk shan river** (*Lat. 21° 28' N., Long. 108° 3' E.*) enters the sea close eastward of Tra Ko island, between shallow banks marked by

*General charts 2062, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° E.*

breakers, nearly 2 miles beyond the island. The channel is about a quarter of a mile wide between these banks; a little farther seaward is the bar, with a depth of 4 feet over it at low water springs and 20 feet at high water springs, accessible to small craft with local knowledge.

The somewhat old directions for entering are: Bring the tree just to the right of the summit of Shuk shan hill in line with the mission church, bearing 340° true, which leads over the bar and up the channel to abreast Tra Ko east point, whence the course is 0° true for one mile, at which distance there is anchorage for small craft in 6 to 10 feet at low water. Boat channels lead to Monkai river, Oanh Xuan bay, &c.

There is anchorage in fine weather seaward of the entrance in 5 to 6 fathoms, with Cape Pak Lung about 4° true.

**Oanh Xuan bay.**—The entrance to this bay lies between banks of sand to the west, and the high land of Cape Pak Lung to the east. It extends to the north-eastward about 3 miles, and then opens out and forms a large bay, mostly dry at low water, at the head of which the River Vai han long discharges. The bay affords secure anchorage for vessels of light or moderate draught in a depth of 5 to 6 fathoms, good holding ground.

The entrance is about half a mile wide between the foul ground extending 8 cables from the cape and the banks to the westward; there is a patch of 1½ fathoms in the fairway, westward of the cape. The bar, which extends nearly a mile seaward of the cape, has about 4½ fathoms at low water, and there are depths of 6 to 7 fathoms within, with good holding ground over a length of about 2 miles by a quarter of a mile in breadth, with a further considerable space for vessels of light draught.

To enter, the extreme of the ledge off the cape should be previously buoyed unless a pilot is obtainable, or until a plan of the place is published.

The place offers no supplies.

#### NORTH SHORE OF TONG KING GULF.

*Chart 2062, Tong King gulf.*

**General remarks.**—The northern shore of Tong King gulf has not been surveyed, except Pak hoi, a treaty port, of importance as a trading centre. The island of Guie chau is situated about 25 miles southward of Pak hoi, and about the same distance from the eastern shore of the head of the gulf. Vessels should pass westward of this island, as, in addition to the unsurveyed adjacent waters, numerous fish-

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° E.*

ing stakes extend off the mainland. These fishing stakes at times extend some 30 miles or more off Pak hoi.

**Tidal streams.**—In the northern part of Tong King gulf, the set of the stream during the day is easterly for 8 hours, and westerly for 16 hours throughout the year.

On full and change days in summer the E. set commences at 3h. p.m.

"	"	"	"	W.	"	11h. p.m.
"	"	"	winter	E.	"	3h. a.m.
"	"	"	"	W.	"	11h. a.m.

and occurring about one hour later every day.

The rate is from a half to  $1\frac{1}{2}$  knots an hour, being accelerated or retarded by the prevailing monsoon.

**CAPE PAK LUNG** (*Lat. 21° 29' N., Long. 108° 11' E.*), situated  $6\frac{1}{2}$  miles eastward of the Shuk shan river entrance, is a prominent point 295 feet in height; the land recedes sharply on both sides, that to the west forming Oanh Xuan bay.

Inland is a chain of mountains from 5,000 to 6,000 feet in height.

Foul ground extends half a mile off the cape.

**Pak lung rock or Pak son kong pai** is a rock which never covers, situated  $6\frac{1}{2}$  miles south from the cape; being so far from the cape, it renders the neighbourhood dangerous at night.

**Tiao Tan** (*Lat. 21° 32' N., Long. 108° 25' E.*).—The coast between Cape Pak lung and Tiao Tan island, 82 feet in height, at 14 miles to the eastward, is but little known; a patch of  $2\frac{1}{2}$  fathoms is charted 103° true, distant 3 miles from the cape, near the edge of the 5-fathoms line, which here is from 4 to 5 miles off-shore. Between Tiao Tan and the islet, 26 feet in height, to the westward of it, the 5-fathoms line is charted about 3 miles off-shore. Westward of this islet is a deep bay into which the Ngan Nan Kiang discharges, apparently encumbered with shallow banks and extending some miles off.

**Long Mun river.**—Between Tiao Tan islet and Tui Mui tiao islet, 65 feet in height, a distance of 17 miles, lies the estuary of the Long Mun, about 10 miles wide, and encumbered with numerous shallow banks with narrow channels between. Good and secure anchorage may be obtained about 12 miles above the bar, abreast and below Long Mun, in depths of 4 to 5 fathoms.

The bar, which has a low-water depth of about 12 feet over a breadth of about half a mile, is situated about  $6\frac{1}{2}$  miles eastward of Tiao Tan islet. It is not advisable to attempt the entrance without local knowledge or a plan of the place. No directions can be offered for it.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° E.*

**Yam tiao fu** (*Lat. 21° 57' N., Long. 108° 36' E.*).—The town of Yam tiao fu is situated about 15 miles above Long Mun, on the River Yam tiao; it is only accessible by boats.

**Coast.**—From Tui Mui tiao, off the east point of the estuary of the Long Mun, the coast eastward forms a shallow bay into which the river on which Lein tiao fu is situated, discharges in its north-eastern portion. Kwantau point is the eastern point of the bay, within which is Pak hoi. The bay has a charted depth of less than 3 fathoms out to a line joining Tui Mui tiao to Kwantau point, and there is a patch of 3 fathoms at 8 miles west from the point, but within the 5-fathoms line. This coast has not been surveyed, and no vessel should venture within the 5-fathoms contour line.

*Plan of Pak hoi anchorage on 875.*

**PAK HOI APPROACH.** — **Kwantau point** (*Lat. 21° 27' N., Long. 109° 2' E.*) in the approach to Pak hoi, is prominent from the offing; it is remarkable as forming the western extreme of a low peninsula, being a range of hills nearly  $1\frac{1}{2}$  miles in length attaining a height of 374 feet, and from a distance appears as an island.

Nautilus hill, 363 feet high, near the shore north-east of the point, is conspicuous from seaward on certain bearings.

The western side of the peninsula is composed of cliffs from 67 to 70 feet high, whilst farther northward there are sand cliffs from 50 to 60 feet high, and fronted by a bank with less than 6 feet water over it to nearly three-quarters of a mile.

**Off-lying shoals.**—There are depths of about 3 fathoms at a short distance westward and southward of the point, but to the eastward there is a bank with shallow water, which gradually increases its distance from the shore to 5 miles or more. A patch which dries at low water, named Pak fu tau sha, is charted on this bank, with Kwantau point bearing 294° true, distant 10 miles; another shoal is charted from 2 to 3 miles eastward of it, and breaks at times. A shoal with  $1\frac{1}{2}$  fathoms on its south end and extending north-north-eastward about 2 miles, was reported, in 1898, to lie with Kwantau point bearing 311° true, distant  $13\frac{1}{2}$  miles, and Guie chau summit 201° true. This coast should be given a wide berth.

**PAK HOI ANCHORAGE**, situated northward of Kwantau point, affords anchorage for vessels of moderate draught; it is sheltered from the sea during the north-east monsoon period, and is protected by sandbanks on its north side, but it is open to the south-west.

**Entrance.** — **Buoyage.** — The channel is about a mile wide, with depths of 3 to  $3\frac{1}{4}$  fathoms abreast Kwantau point,

*General charts 2661a, 1263.*

*Plan of Pak hoi on 875. Var. 1° E.*

reduced to about half that width abreast Tikok, off which there is anchorage in 4 to 5 fathoms; above the fishing stakes, which here stretch across the channel, there is anchorage in  $3\frac{1}{2}$  to 4 fathoms. The channel between the fishing stakes is generally about 90 yards wide, though the stakes are not always laid out in the same direction; its south side is marked by a red conical buoy with staff and ball, and the north side by a black buoy with staff and diamond. The black and white striped buoy in the anchorage is in  $2\frac{1}{2}$  fathoms, near the edge of the 3-fathoms contour, within which the water shoals quickly.

**Caution.**—The approach to Pak hoi is encumbered with fishing stakes, which in some places extend as much as 30 to 40 miles from the coast, dangerous to the screws of vessels not keeping a good lookout.

**Directions.**—Access to Pak hoi anchorage is easy. Kwantau point may be approached on a  $350^\circ$  true bearing until about a mile from it, when course should be shaped to give it a berth of about half a mile; from abreast the point course should be gradually altered to  $0^\circ$  true, to round the bank extending off Nautilus hill and the sand cliffs; when Tikok bears  $80^\circ$  true, steer  $69^\circ$  true for the anchorage. If going to the inner anchorage, pass between the two buoys marking the passage through the fishing stakes, anchoring westward of the black and white buoy unless of very light draught.

**Tides.**—It is high water, full and change, at 5h. 10m.; springs rise 16 feet, neaps 11 feet, approximately. The streams set through the anchorage at the rate of 2 knots at springs, and half a knot at neaps.

**PAK HOI**, situated 4 miles north-eastward of Kwantau point, immediately under a low sand ridge on the south side of the anchorage, is a treaty port, opened in 1877. The town, formed of two long irregular streets, is unsanitary; it has a population of about 20,000 inhabitants. The landing is good at high water.

The smaller settlement of Tikok, a fishing village, is situated on the point nearly midway between Pak hoi and Kwantau point.

A British Consul resides at Pak hoi; there is a Custom house, as charted.

**Trade.**—The exports consist of indigo, hides, fish, pigs, tobacco, sugar, &c.; and the imports of Indian cotton yarn, shirtings, opium, metals, flour, kerosene oil, woollens, &c. The value of the imports in 1911 amounted to 1,460,216 Hk. taels, and the exports to 979,167 Hk. taels. In the same year 119 steam vessels entered, with an aggregate of 90,467 tons; only one British. Sailing vessels, nil.

*General charts 2062, 2661a.*

*Plan of Pak hoi on 875. Var. 1° E.*

**Communication.**—There is telegraphic connection with Hong Kong. The French mail steamers running between Kwang chau wan and Haifong, bi-monthly, call here, and others; and there is constant communication by steam trading vessels.

**Supplies** of meat and vegetables are obtainable at moderate prices; the water is unwholesome. No coal is obtainable.

**Climate.—Winds.**—The rainy season at Pak hoi is from January to June, but it does not rain uninterruptedly or heavily; from January to April heavy northerly gales blow frequently and rise suddenly, lasting sometimes three days. Warning, however, of these gales will be given by the barometer rising, and the opposite coast becoming visible, which, under other circumstances, cannot be distinctly seen from Pak hoi.

Typhoons occur occasionally from June to October; their centres, however, are said always to pass southward.

*Plan of Guie chau on 875.*

**GUIE CHAU**, an island situated about 23 miles southward from Kwantau point, Pak hoi, is  $4\frac{1}{2}$  miles in length north-east and south-west, and 3 miles in breadth. The south and west sides of Guie chau are composed of hills rising abruptly from the water and sloping gradually to the north-east shore. Humpel hill, the summit, 279 feet in height, is near the south-east extreme of the island, and has a small building on it, which makes an excellent mark; it is situated in lat.  $21^{\circ} 14' N.$ , long.  $109^{\circ} 6\frac{1}{2}' E.$ ; see view on plan.

The island is inhabited, fertile, and well cultivated.

The west, north, and north-east sides of Guie chau have not been surveyed, and should not be approached within 2 to 3 miles; the general chart, 2062, shows it foul northward to the distance of 2 miles. At night, when in the vicinity of this island, do not shoal the water to less than 10 fathoms.

The head of the gulf within Guie chau is shallow, and numerous fixed fishing stakes encumber it. Vessels should not venture eastward of the island.

Discoloured patches of small diameter, having an appearance of shoal water, are very common between Guie chau and Pak hoi. They are only detached mud whirls, or weed patches.

**Nam Wan**, a bay situated on the south side of Guie chau, is about a mile in extent, with depths of 4 to 5 fathoms good holding ground, and sheltered from all winds except those between S.S.E. and E.S.E. Southerly winds, however, seldom blow home, and are never very strong.

*General charts 2062, 2661a.*

*Plan of Guie chau on 875. Var. 1° E.*

The entrance of Nam Wan is  $1\frac{1}{2}$  miles wide; it is, however, contracted to half a mile by a shoal of  $1\frac{1}{2}$  to 2 fathoms which surrounds and extends half a mile in a south-easterly direction from Petit Cochon, a rocky islet 95 feet high, on the east side of the entrance. From the east entrance point a shoal of one to 2 fathoms extends 2 cables off; and from the west entrance point foul ground extends nearly half a mile in a south-easterly direction.

On the beach at the head of Nam Wan there is a village, a short distance westward of which, and about half-way up the cliff, stands a Chinese temple; it is now hidden from seaward by plantations of trees, and is no longer available as a landmark.

**Population.**—The population of Guie chau is about 4,500, the principal occupation being the cultivation of sugar-cane and bananas.

**Supplies.**—Fish and fruit are plentiful, a few fowls also can be procured.

*Chart 2062, Tong King gulf.*

**Chai une island**, about 500 feet high, lies 6 miles south-east from Guie chau. It is a mile in length, and except from the eastward, shows a high bold cliff at its west extreme, above which is the summit. A village is situated in the valley in the middle of the island. Chai une affords no anchorage.

**Soundings.**—At 28 miles south-east of Chai une island, there are general depths of 7 to 8 fathoms, increasing towards the island, near which long streaks of weed and patches of discoloured water may be seen, which have the appearance of shoal ground, but the soundings only indicated a gradual change of depths. The neighbourhood is better avoided until properly surveyed.

**COAST.**—At about 30 miles eastward of Kwantau point, Pak hoi, is a bay about 20 miles wide, the north-eastern head of Tong King gulf, with Guie chau island in its approach, above described. It is encumbered with numerous shallow banks, between which is a shallow channel usually marked by stakes, leading to Skek tau po (Lat.  $21^{\circ} 36' N.$ , Long.  $109^{\circ} 33' E.$ ) and Shan hau, with Chinese villages on its shores.

Um po, on the eastern side, is approached between the banks Teo shin sha and Tam kon sha; these channels are available by small craft in charge of a pilot or a fisherman of the neighbourhood.

Inland is a mountain range, Pak mah chong (White Horse hill); the western summit is about 2,000 feet in height; the eastern summit, Ku Kun chong (Cockscomb hill), is 2,390 feet, and charted in lat.  $20^{\circ} 58' N.$ , long.  $109^{\circ} 52' E.$

*General charts 2062, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° E.*

**Caution.**—This bay, as well as the western coast of Lei chau peninsula, has not been surveyed, and every care must be taken should it be found necessary to visit this locality, and to avoid the fishing stakes, which extend to or beyond Guie chau island, as before mentioned.

Rough outlines of banks are shown, namely, the Teo shin sha, Tamkon sha, Sam sha, and Bau cum sha, bare of soundings.

Mong tau point, about 25 miles northward of Cape Kami, the north-west extreme of Hainan strait, is said to be foul to the distance of 5 or 6 miles.

**Nausa bay** (*Lat. 20° 17' N., Long. 109° 52' E.*) lies southward of Ushek point, and has a river and a village of same name at its head; it has not been sounded.

Nausa point is low and shelving. It is a ridge of lava about  $1\frac{1}{2}$  miles in length, the outer part of which is covered at high water.

**Aspect.—Carpenter range.**—The coast near Nausa bay is low and wooded, rising gradually to Carpenter hill, the flat summit of a range visible from near Cape Kami in Hainan strait.

Approaching from the westward or north-westward, Carpenter hill will first appear; the Shenwen range, 510 feet in height, will be seen some time before Cape Kami comes in sight.

**The coast** southward is considered with Hainan strait, page 335.

*General charts 2062, 2661a, 1263.*



## CHAPTER VII.

## HAINAN ISLAND AND STRAIT.

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Variation nearly stationary.

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*Chart 2062, Tong King gulf. Var.  $1\frac{1}{4}^{\circ}$  E.*

**HAINAN ISLAND.** — **General remarks.** — Hainan island, bounding the Tong King gulf to the eastward, is about 155 miles in extent north-east and south-west, and about 90 miles in breadth.

It forms part of the province of Kwang tung, but the authority of the Chinese is not effective at any distance inland; it is almost without roads.

Its southern half is entirely mountainous, attaining a height of 5,870 feet in the Great Ng chi range (Five large fingers, locally known as Loi Mother or Loi Vöi, from a remarkable peak with five nipples), and visible from Hainan strait at times; the northern portion of the island is low, with a few scattered hills, presenting totally different geological characteristics from the southern half, giving the impression that the two have at some time been united by a volcanic upheaval. While the fauna and flora of the northern half resemble in every respect those of the Lei chau peninsula (on the opposite side of Hainan strait), the southern part is entirely different, exhibiting the most tropical forms of life and vegetation. The mountains are covered with a dense vegetation, and in the plains are cultivated rice, sugar-cane, areca or betel-nut trees, and tobacco.

**Exploitation.**—Acting Consul G. W. Pearson, accompanied by Lieut. Simonds and the Rev. Clarence Newton, started in February, 1910, to ascend the Five Finger mountains; though they did not get near the summit, they added considerably to the knowledge of the island. They ascended the river from Hoi hau by native boat to Tingan, some miles above Fahi, thence by ponies and a few carriers into the Loi country, some 3,000 feet above the sea, with but little obstruction from the natives. Beyond this the natives refused to act as guides, and apparently none of them had ever ascended the mountains. The village of Miao, about 4,000 feet above the sea, was visited—a high climb which taxed their endurance to the utmost. Two of the Europeans were suffering from malaria, and as there appeared to be no likely cessation of the rains then prevalent, the intention was aban-

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var.  $1\frac{1}{4}^{\circ}$  E.*

done, and the party returned by a detour westward and northward, through Fan hiang, Fan Luen, and Nam Fung, thence across Pochung river, where everything became Chinese. Thence through Taifong to Nodoa (about *Lat.  $19^{\circ} 30'$  N., Long.  $109^{\circ} 40'$  E.*), thence to Fahi and Hoi hau by land. The report states that the island would greatly repay exploitation. With the mineral resources which are known to exist, gold, tin, iron, and copper, and those which should properly exist from the nature of the geological formation, but which, owing to the absence of any scientific prospecting, have not been discovered, together with the virgin forests of the mountainous region, the undeveloped fertile plains of the northern section, and the extensive fisheries, Hainan should one day prove one of the richest portions of the Chinese Empire. Apart from its commercial aspect, it has a political importance, situated, as it is, fairly close to Haifong, Hong Kong, and Macao.

**Kiung chau fu** or K'ing Tao (*Lat.  $20^{\circ} 2'$  N., Long.  $110^{\circ} 22'$  E.*), the capital of Hainan, and its sole treaty port, Hoi hau, are situated on and near the banks of the Kim Kang, or de l'Or, on the north coast of the island, and connected by a broad road and rough paths. It is a walled city, the walls being 30 feet high, with four gates. The merchandise that comes down the river in junks from the interior is transhipped at Pak siang, the head of the delta, and has a yearly value of about 25 millions of francs. Probably not five per cent. of the total area of the island is under cultivation.

There are great possibilities for the trade of the island if the port of Hoi hau were deepened. The improvement of the channel to admit steam launches and large covered lighters at all states of the tide would preclude delay to steamers and damage to cargo, but the apathy of the officials, if continued, will not only retard development but drive away trade. *See* population and trade of Hoi hau, page 340.

**Coasts.**—The south-east and south coasts of this island are generally bold to approach, but banks have been reported in places, and others may exist. Off the west coast are several shallow banks, the farthest known of which is about 18 miles off South-west point.

The south coast is indented with several bays, affording good anchorage and shelter during the north-east monsoon period, but they are partly open to southerly winds; the north-west coast also affords good anchorage.

**Caution.**—The island, with the exception of the portion forming Hainan strait, has not been surveyed, consequently the position of a vessel is not to be accurately obtained by cross bearings.

**Population.**—The population is composed of three distinct classes of inhabitants; those in the interior, known as the Loi, about half a million, as a rough estimate, are supposed to have originally

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1 $\frac{1}{4}$ ° E.*

come from Cochin-China; the Miaos, considered to be the original inhabitants, are scattered through all the southern districts of Hainan, migrating when the soil gets poor. They live at higher levels than the Lois, and pay no taxes, regarding themselves as the rightful owners of the land; they are very hospitable. The coast population, at the north-east and south and south-west sides, consists mainly of a low class of Chinese, who obtain their living by cultivating the soil, fishing, and by occasional acts of piracy; those at the north end of the island are known as the Tai people.

There are numerous fast sailing fishing-boats and junks belonging to the island; many of them go every year on fishing voyages, and navigate to seven or eight hundred miles from home, to collect the bêche-de-mer, and procure dry turtle and sharks' fins, which they find amongst the numerous shoals and sand cays in the south-east part of the China sea. Their voyages commence in March, and they continue to fish until the early part of June, when they return, picking up their small parties left on various cays, and their collections.

The population of the island in 1896 was estimated to consist of 1,700,000 Chinese (including the Lois), 100,000 Sai and other tribes of the same origin, and 5,000 Miou (Miaos), two races still independent. The foreign, that is, non-Chinese, population of the island, at the end of 1911 was 91, of whom 30 were British subjects.

**Fauna.**—The fauna of Hainan is entirely different from that of South China. There are three species of deer, leopards, bears (the latter, according to the Lois, attaining the size of a pony in the Five Finger district and exceedingly ferocious), monkeys, squirrels, porcupines, ant-eaters, and flying foxes. Of reptiles there is a large variety, pythons attain a length of 30 feet or more, boa constrictors, lizards, cobra, bamboo and coral snakes which are deadly. Fish in endless variety—the Hainan whale, sharks, and a quantity of tropical fish; carp, roach, dace, and barbel are found in the rivers. There are some 170 species of birds, nineteen of which are new to science, amongst which are the silver pheasant, jungle fowl, partridges, and almost every kind of water-bird.

**Flora.**—The flora of the island offers a practically new field to the botanist; the types found are more akin to the growths of Malay and the Philippines than those of the southern provinces of China. Among the fruits are the cocoanut, which is shipped from all the eastern ports to Hong Kong, &c., the papaya, mango, lichee, pineapple, custard apple, oranges, bananas, &c. The betel-nut is largely exported; the bamboo is the most valuable, everything in Hainan, as in China generally, seems to be built of bamboo—from a house to a tooth-pick. The rattan is a permanent industry in the Lois country; sugar-cane is largely grown in the plains; tobacco is grown inland, also indigo and

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var.  $1\frac{1}{4}^{\circ}$  E.*

hemp. There is an immense quantity of timber almost untouched on the hills, consisting mainly of oak.

**Minerals.**—There are various minerals in the island; see Exploitation on pages 314, 315.

**Missions.**—An American Presbyterian mission is established in the island, inaugurated in 1881. Its personnel includes three doctors, at least seven ordained clergymen, and about ten lady missionaries, distributed through the four stations of Hoi hau, Kiung chau fu, Nodoa, and Kachek. At each of these is a school, and at Hoi hau and the last two towns, a hospital. At Hoi hau is an imposing church, accommodating 500 persons.

Romanist missions were established in the island by the Jesuits as far back as 1630, and which flourished until the time the Jesuits were suppressed. The number of Romanists now on the north part of the island is very small; altogether there are about 1,000 on the island. Two priests and two sisters (all French) are stationed here.

**Communication.—Telegraph.**—See Hoi hau, page 341.

**Climate.—Winds.**—The north-east monsoon in Hainan brings rain and is the cool period, but fogs are frequent; that of the south-west, on the contrary, brings a high temperature with almost daily squalls. The typhoon months are from June to October, those which occur in August and September being considered the worst.

The most agreeable months in Hainan are December and January, when the temperature is at its minimum, namely, about  $50^{\circ}$  at 6 a.m., and  $57^{\circ}$  at 2 p.m. In February it rises to about  $52^{\circ}$  and  $59^{\circ}$ , in March  $63^{\circ}$  and  $73^{\circ}$  at the same hours.

In April there is but little wind, and the temperature rises to  $82^{\circ}$ . May is very hot, and June scarcely bearable, the shade temperature reaching  $95^{\circ}$  and keeping up to  $82^{\circ}$  during the night. The records received do not go beyond this.

The following remarks are by Commander Carpenter, H.M.S. *Maggie*, when surveying Hainan strait in 1880:—

The average heat during the summer is not exceptionally high, but it is aggravated by the continual calms; the nights are cool. A thunder-storm usually occurs between one and 4 p.m., lasting from one to three hours, with occasionally a sharp squall. At the end of August and in September, westerly winds blow as often as easterly, but the former always brings rain or thick weather. During the winter months, easterly winds prevail. Sharp squalls lasting from 10 to 20 minutes are common in Hainan strait during the months of June and July, often blowing with a force of 6 to 8; the squalls are generally preceded by a blue haze or tint over the land, and are dangerous to boats under sail or with awnings spread.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var.  $1\frac{1}{4}^{\circ}$  E.*

The following shows the average direction and force of the wind from May to September.

May.—From South to S.E.; force 1 to 4. A short rain-squall nearly every afternoon.

June.—From South to S.E.; force 1 to 4. Rain-squalls as in May. A heavy gale from South, experienced on 28th June, force 10, lasted for 12 hours.

July.—From South to S.E.; force 1 to 4. Occasionally North-easterly and calm, the latter part of the month, Westerly 2 to 4. Rain-squalls less frequent. 17th July, a heavy gale from North continued for 12 hours, when it shifted to South and blew just as hard (force 9 to 10) for 12 hours.

August.—From South to West; force 1 to 4. Occasionally S.E., 2 to 3. A few rain-squalls. 1st August, heavy gale, as on 17th July. August 31st typhoon for 24 hours, force 11 to 12. Barometer, 28.83 inches.

September.—Variable North-easterly to South-easterly; force 1 to 4. Hardly any rain-squalls.

#### SOUTH AND EAST COASTS.

*Plan of Gaalong bay on 1019. Var.  $1^{\circ} 30'$  E.*

**CAPE BASTION** (Lat.  $18^{\circ} 9' N.$ , Long.  $109^{\circ} 35' E.$ ), the south extreme of Hainan, and the south point of a high, bold, and rocky peninsula, is visible from a distance of 25 or 26 miles in clear weather. The water is deep at a short distance off it.

**GAALONG BAY.**—At  $3\frac{1}{2}$  miles eastward of Cape Bastion is a black rocky point, named Cape Rhinoceros, forming the west extreme of Gaalong bay, which is about 5 miles wide and 3 miles deep. In the eastern part of the entrance are two round islands, 300 and 340 feet in height, named East and West Brother, and near the middle of the northern part of the bay lies St. Peter or Middle island, 300 feet in height. Westward of St. Peter island there are three rocky islets, distant about three-quarters and  $1\frac{1}{2}$  miles. The bottom along the western side of the bay is said to be generally foul. A reef is reported to extend off the north-east extreme of the East Brother.

The usual anchorage is off Gaalong village, in Sampan bay, eastward of St. Peter island, in 7 to 8 fathoms water, sand and mud bottom. Here vessels are sheltered from all winds by the high land, except those between South and S.W., which force a considerable swell into the bay. A small vessel might moor close under the north side of St. Peter island in 4 to 5 fathoms, mud, and be sheltered from all winds; the depth is said to decrease to 3 fathoms half-way towards the north shore of the bay, and the bottom is sandy.

*General charts 1342, 2661a, 1263.*

*Plan of Gaalong bay on 1019. Var. 1° 30' E.*

**Directions.**—The bay is but scantily sounded, and should be entered with caution. All the three channels are said to be equally safe, guarding against the reef, which is said to extend from the north-east point of the East Brother.

**Supplies.**—Small bullocks, fowls, and sweet potatoes are procurable at Gaalong village. Water is obtainable from the small stream northward of the anchorage. Firewood is abundant. Sampan village, in the north-east corner of the bay, is the base of a small fishing fleet.

*Chart 2062, Tong King gulf.*

**LEONG SOI (Ling sui) BAY**, eastward of Gaalong bay, is about 15 miles wide by 4 miles in depth, and open to the south-west monsoon.

**Leong soi (Ling sui) point** (*Lat. 18° 24' N., Long. 110° 3' E.*), its eastern extreme, is formed by several high hummocks having a sandy plain to the northward; a reef extends some distance off the point, and a sunken rock, which breaks, is charted near the shore at  $1\frac{1}{4}$  miles 40° true of the point, reported by the Chinese gunboat *Sui tsing*. The bay has several sandy beaches, and near its western shore are two islands, but they are too small to afford shelter for vessels anchoring between them and the coast; near them is the large village of Tong kin on a small stream.

Sugar Loaf point lies 2 miles westward of Leong soi point, with a hill of that shape over it; and about 2 miles farther to the north-west are several dry rocks, steep-to, which extend three-quarters of a mile from another point.

**Lagoon.**—At  $1\frac{1}{2}$  miles northward of this latter point is a narrow passage, which leads between two sandy points into an extensive salt-water lagoon of an oval form extending about 7 miles north-eastward, but banks of coral and sand render its navigation difficult; it can be entered by junks of 8 feet draught. There is a small fort on the west point of the entrance.

At the back of the lagoon rise the high and unpenetrated Leong soi mountains, which harbour the wild Lois (natives) who subsist on the rich products which are brought down the river.

**The town** of Leong soi (Ling sui), the residence of a mandarin, is 7 miles up the Leong soi river, which enters the head of the lagoon. There are two large villages in the lagoon.

**Anchorage.**—Vessels will be sheltered in Leong soi bay during the north-east monsoon period by anchoring well in towards Table mount in about 10 or 12 fathoms, with the fort bearing 34° true about 3 miles.

*General charts 1342, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° 30' E.*

Water of good quality can be obtained from the point near the anchorage.

**Doubtful dangers** are charted at 6 miles and 12 miles south-eastward of Leong soi point; the *Daniel J. Richard* is said to have touched on the inner one in 1872, and breakers were reported in 1890 by the *Turenne* at the other. Caution should be exercised when in this neighbourhood.

**The COAST** between Leong soi point and Malautau point, about 25 miles north-eastward, forms a large bay, in which may be seen many sandy beaches and high land near the shores, but it affords no safe anchorage during the southerly monsoon. In the vicinity of the coast near the middle part of the bay, are three prominent peaks of a range of mountains, the centre one being the most pointed, a little higher than the others and 2 miles from the shore. About 18 miles inland there is another mountain of similar appearance, but higher; it was seen from the eastward nearly 90 miles distant, forming three peaks. Malautau point, 820 feet in height, is the south extreme of a range of hills; one within it is 940 feet high.

**Islands.**—**Tien Fung** (*Lat. 18° 26' N., Long. 110° 8' E.*), or Sail rock, 121 feet in height, lying north-eastward,  $5\frac{1}{2}$  miles from Leong soi point, is one of a cluster of large rocks, which, from its being higher and whiter than the others, with the appearance of a junk, has acquired the name of Sail rock. There is a depth of 14 fathoms charted between it and the shore, from which it is distant nearly 3 miles.

**Islets.**—There are three islets north-eastward of Tien Fung, the western of which, the Saddle, 338 feet in height, has two hummocks on it.

*Plan of Nam hoi chun and Chue tau on 1019.*

The eastern island, Namking chau, is 526 feet high, and the Middle island 260 feet in height. All three islands are about  $1\frac{1}{2}$  miles off-shore, but they are too small to afford shelter from the sea.

About 5 miles south-west of Saddle island lies Hau tau wan, but it is too shallow for an anchorage. About 2 miles 333° true from Namking chau, westward of Chue tau, or Pigs head, is the entrance to Chue tau kong, an inlet leading to the village of Shing lau and to the town of Mun chau; there are two remarkable rocks at the entrance of the lagoon, where there is a bar upon which the sea breaks.

**Fishing nets.**—In moderate weather bamboos may frequently be seen standing erect above the surface of the sea; they are the buoys

*General charts 2661a, 1263.*

*Plan of Nam hoi chun and Chue tau on 1019. Var.  $1\frac{1}{4}^{\circ}$  E.*

of drift nets, which the fishermen place sometimes a long distance from the land, to catch flying fish.

**Anchorage.**—There is anchorage, during the north-east monsoon only, off Nam hoi chun, at about 2 miles north-eastward of Namking chau (*Lat.  $18^{\circ} 39' N.$ , Long.  $110^{\circ} 21' E.$* ), westward of Malautau point, in depths of 6 to 9 fathoms, at from three-quarters of a mile to 2 miles off the sandy beach on the shore northward; also northward of Namking chau, in the bight westward of Chue tau, in 2 to 3 fathoms.

*Chart 2062, Tong King gulf.*

**The COAST**, from Malautau point, trends 13 miles north-eastward to Sifa or False point, showing a flat country faced with sand beach, with here and there hills rising like islands close over the shore; some of these hills project slightly seaward, and form slight shelter for junks during the north-east monsoon.

*Plan of Tai chau or Tinhosa on 1019.*

**TAI CHAU OR TINHOSA ISLAND**, is  $2\frac{1}{2}$  miles in extent in a north and south direction; it is formed by two ridges united by a sandy isthmus (*Lat.  $18^{\circ} 42' N.$ , Long.  $110^{\circ} 27' E.$* ), which partly covers at high water springs.

The highest hill charted on the southern portion is 797 feet in height; the highest hill on the northern part is charted as being 453 feet in height. They are covered with thick foliage, chiefly pandanus and palmettos.

A detached sandbank, with  $3\frac{1}{2}$  to 5 fathoms water and possibly less, lies between a quarter and 2 miles westward of the northern part of the island.

The channel between Tai chau and the coast is about 3 miles wide, and the depth of water is stated to be from 9 to 14 fathoms westward of the sandbank mentioned, but it is better avoided until surveyed.

**Water** and firewood can be obtained at Tai chau; the beaches are the head-quarters of a fishing fleet which feed the neighbourhood.

**Anchorage.**—There is sheltered anchorage westward of the island in about 7 fathoms, at about a third of a mile off the isthmus, known as the West anchorage.

Tai chau is of importance as an anchorage or refuge when the north-east monsoon is blowing strong, for small-powered steam vessels proceeding by this, the direct route from Singapore to Hong Kong. It affords a perfect lee, and with the exception of Ch'unlan is the last anchorage, before a vessel leaves the shelter of the coast and steers out for Hong Kong.

*General charts 2062, 2661a, 1263.*



*Plan of Tai chau or Tinhosa on 1019. Var.  $1\frac{1}{2}^{\circ}$  E.*

The anchorage off the east side of the island, abreast the isthmus, will afford anchorage in the opposite season in a depth of 11 to 12 fathoms.

*Chart 2062, Tong King gulf.*

**COAST.**—**Sifa point** (*Lat.  $18^{\circ} 48' N.$ , Long.  $110^{\circ} 32' E.$* ), 494 feet in height, lies 13 miles north-eastward of Malautau point, and has a sunken rock off it. The coast between is chiefly sandy beach, divided by two or three high rocky points; the southernmost, Baker hill, 390 feet high, has or had a pagoda on it.

**Round islet**, 340 feet high, lies 3 miles westward of Sifa point, and has a rock awash at low water at half a cable south-east of it.

**False Tinhosa**, is an islet 150 feet high, 2 miles north-eastward of Sifa point, and from a north or south bearing a pillar rock shows at its eastern extreme. A rock, 10 feet high, stands on the end of a ledge extending north-north-west of False Tinhosa. There is little or no shelter under this island.

**A bank**, the existence of which is doubtful, is charted  $68^{\circ}$  true, about  $5\frac{1}{2}$  miles from False Tinhosa.

**The coast** from Sifa point trends in a north-easterly direction 57 miles, to Tonkon point, and is low; it is, however, marked by a conspicuous pagoda at Pak ngo, situated 20 miles north of Sifa point, and by another at Kachek, 10 miles north of Pak ngo, and nearly as far inland.

At about  $6\frac{1}{2}$  miles northward of Sifa point, and within a mile of the coast, are the Twin Black rocks, known also as the Jumeaux, 20 and 30 feet high. Abreast them is a stream, with plantations of cocoanut trees. The country around is flat, with hills here and there.

Northward of Pak ngo, to Tonkon point, the shore is lined with cocoanut groves, and is protected by a barrier reef from one to 3 miles seaward, having passages through the reef opposite to fresh-water streams on the coast. Junks work up inside the barrier in smooth water, calling at several small ports. The northern of these ports, named Fung ka, is about 8 miles south-westward from Chun lan fort. Anchorage southward of Fung ka may be obtained during the north-east monsoon in 4 fathoms, sand, under the lee of the reef, which here forms an elbow and joins the land.

The coral reefs are awash at half-tide, having depths of from 5 to 6 fathoms water close outside them.

*Plan of Chun Lan on 1019.*

**CHUN LAN (Ch'unlan)** (*Lat.  $19^{\circ} 32' N.$ , Long.  $110^{\circ} 49' E.$* ), situated about 15 miles south-west from Tonkon point, at the mouth

*General charts 2062, 2661a, 1263.*

*Plan of Chun Lan on 1019. Var.  $1\frac{1}{4}^{\circ}$  E.*

of Wench'ang river, is the only sheltered port between Yu lin kan and Nau chau, and is a capital typhoon harbour for such craft as can cross the bar, which has a depth of 9 feet at low water, with a spring rise of about 6 feet.

A vessel drawing 11 feet has entered at half-tide, when the banks were visible on either side.

Reefs, which break, extend from both points of the entrance to a distance of one mile seaward of the fort on the eastern side, leaving a channel to the river about a cable wide between them; a ridge of rocks, dry at low water, extends about half a mile from the fort on the north-west entrance point nearly half-way across the channel.

The shore in the vicinity of the entrance is composed of a low sand ridge with cocoanut trees extending almost to the water's edge.

**Directions.**—To enter, bring the fort to bear  $2^{\circ}$  true, as in view on plan, when distant about 2 miles, and steer for it on that bearing, until the first joss-house to the eastward of the entrance bears  $42^{\circ}$  true, when the vessel will be close to the shoalest part of the channel. Then shape a course  $355^{\circ}$  true for the joss-house up the river (the roof only of which is visible above the bank), which leads between the breakers on either side and within half a cable of the fort; following the bend of the river will then lead eastward of the rocks extending from the western shore. There is but 9 feet in the channel here at low water over a rocky bottom, the same depth as on the bar; the plan is but a sketch, and must be used with caution.

**Anchorage.**—There is a somewhat confined anchorage for a small vessel, in 3 fathoms, just inside Fort point.

H.M.S. *Egeria* anchored off Chun lan river in a depth of 7 fathoms hard sand, with the fort on the east point of entrance to the river bearing  $327^{\circ}$  true, and Mount Tonkon  $52^{\circ}$  true.

**Chun lan (Ch'unlan)** is the head-quarters of a considerable junk trade to Singapore and Siam. The people though quiet were not friendly (1894), and the natives should not be trusted as pilots.

*Chart 2062, Tong King gulf.*

**COAST.**—**Tonkon point (Tungku shan).**—**Mount Tonkon (Tungku)** (*Lat.  $19^{\circ} 40'$  N., Long.  $111^{\circ} 2'$  E.*), the summit of a range of hills, 1,229 feet high, is a dark-coloured mountain, from which a point with three or four hillocks stretches  $2\frac{1}{2}$  miles south-south-east to Tonkon point. A cluster of rocks above water, one of which is 15 feet high, extends half a mile from the point, southward of which is the barrier reef.

There is but little shelter under the point in a strong north-east monsoon, at which time the swell rolls in heavily along the whole line

*General charts 2062, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. 1° E.*

of shore; rocks just above water exist in the most sheltered portion, and the bay is encumbered with discoloured patches.

**Lorne rock**, on which the British steam vessel *Lorne* foundered in 1888 after striking it, in the middle of the night, is a pinnacle rock with a depth of 6 feet at low water, situated with Chun lan fort bearing 290° true, distant 12½ miles, and Mount Tonkon 356° true. The rock is 60 feet long and 15 feet wide, and is surrounded by depths of 30 fathoms.

**CAUTION.**—This coast has not been surveyed; other reefs may exist beyond those charted. Vessels, therefore, proceeding along the land to avoid the strength of either monsoon, should exercise caution; and the use of the lead is enjoined. If standing northward, by night, Tonkon point should be given a wide berth, as there is usually a set towards the shore.

**The COAST** from Tonkon point apparently trends in a northerly direction, 24 miles to Mofu point, but it is only shown in hair line; northward of Tonkon point for some distance the shore is said to be low and sandy, beyond which it becomes again high.

*Chart 876, Hainan strait.*

**MOFU POINT** (*Lat. 20° 1' N., Long. 110° 56' E.*), the north-east extreme of Hainan island, when seen from the eastward, resembles Tonkon point. It is backed by a double-peaked black hill of the same name, 655 feet in height, and visible from a considerable distance in clear weather. The point is sandy, and is bordered by a reef, to a distance of about 2 miles, steep-to.

Owing to the prevailing thick weather during the north-east monsoon, Mofu point is frequently difficult to distinguish by vessels making it from the north-eastward; it may be recognised by a conspicuous conical tomb close to its extreme; also by the hills west of the point being of a reddish soil, whilst those to the southward are higher, and covered with black patches.

**The coast** from Mofu point to the westward, forming the south side of Hainan strait, is referred to on page 344.

**TAYA ISLANDS**, separated from Hainan island by a channel about 13 miles wide, with depths under 20 fathoms, consist of two groups of high, almost inaccessible, barren islands, seven in number, with some off-lying rocks.

The north-east group consists of four islands. North Taya island (*Lat. 19° 59' N., Long. 111° 16' E.*), 648 feet high, the northernmost and largest, can be seen in clear weather from a considerable distance. At half a mile southward of it is Perforated island, 375 feet high, with sunken rocks between. A cone-shaped islet of the same height

*General charts 2661a, 1263.*

*Chart 876, Hainan strait. Var. 1° E.*

lies close off its south-west end, with sunken rocks close southward of both. The south-westernmost island of this group lies  $1\frac{1}{4}$  miles from North Taya island, and is 388 feet high.

The south-west group consists of three islands, the northernmost of which, 175 feet high, is very small. The middle and largest of this group, three-quarters of a mile from the northernmost island, has three peaks, the highest being 456 feet high; there is a sunken rock close off its north extreme. South Taya island, 276 feet high, at  $2\frac{3}{4}$  miles from the northernmost of this group, makes as two islets from the northward and eastward; there is a sunken rock off its north side.

The depths in the passage,  $3\frac{1}{4}$  miles wide between the two groups, range from 23 to 33 fathoms.

**Anchorage.**—Temporary anchorage may be obtained in 20 fathoms, mud, about one mile south-westward of North Taya island, but a swell rolls round the island during the north-east monsoon.

## SOUTH AND WEST COASTS.

*Chart 2062, Tong King gulf.*

**Aspect.**—On the south and west coasts are several mountain summits, useful for identifying the coast when approaching it. About 20 miles north-westward of Cape Bastion, the south extreme of Hainan, is Mount Horn, 3,160 feet in height, so named from its appearance from the eastward. From the westward it appears as a round summit. It is situated in lat.  $18^{\circ} 26' N.$ , long.  $109^{\circ} 22' E.$  South-eastward of it is Pagoda mountain. About 17 miles within South-west point is the pinnacle summit of Mount Etna, 4,967 feet in height, and farther north-eastward the Great Ng chi range, the highest peak of which, 5,870 feet, is the summit of the island; there are many peaks in this range over 4,000 feet in height, but they will probably be enveloped in clouds at most times. *See also* page 330, and view at the bottom of chart 2062.

**Whirlpools**, or eddies, caused by the tidal stream or current rushing over uneven bottom, are frequently met with off these coasts, and have been reported as breakers; no opportunity should be lost of getting a cast of the lead when seen to avoid them being charted as dangers if reported without doing so.

*Plan of Yu lin kan bay on 1019. Var.  $1\frac{1}{2}^{\circ} E.$*

**YU LIN KAN BAY** (Lat.  $18^{\circ} 11' N.$ , Long.  $109^{\circ} 32' E.$ ), situated on the west side of Cape Bastion (page 318), affords in the harbour at its head, the best anchorage on the southern coast of Hainan.

The bay is separated from Sama bay to the westward by a long

*General charts 1342, 2062, 2661a, 1263.*

*Plan of Yu lin kan bay on 1019. Var.  $1\frac{1}{2}^{\circ}$  E.*

narrow strip of land, which terminates in Cape Salomon, between which and Tomb point, 147 feet high, is the entrance,  $4\frac{1}{2}$  miles wide. About one mile northward of Tomb point is Belier island, connected with the shore by a reef; a sunken rock lies off its north-west extreme.

**Anchorage.**—The bay offers good anchorage in the north-east monsoon period only, in depths of 6 to 7 fathoms, good holding ground, eastward, or within Yu lin kan point, over a space of a mile or more in extent, with a sand and mud bottom mixed with broken shells. There is a spacious anchorage farther out, in 9 or 10 fathoms, on a mud and sand bottom, good holding ground, about three-quarters of a mile north-westward of Belier island, but the whole of the bay is exposed to the wind and swell during the south-west monsoon period. There appear to be no hidden dangers in the bay, excepting the small reefs that extend a short distance off the shores.

During the north-east monsoon the wind blows from E.N.E. across the bay, so that a sailing vessel can fetch into the inner harbour.

**The harbour** at the head of the bay is surrounded by hills, affords secure shelter at all seasons, and is available for vessels of moderate draught; the entrance, though narrow, has a low water depth of  $4\frac{3}{4}$  fathoms over a breadth of about half a cable; the depths in the southern or outer are from  $3\frac{1}{4}$  to 5 fathoms, but not over any great extent; the bottom is soft mud; the north-eastern part affords good anchorage for small craft in about 2 fathoms.

**Reefs.**—The east point of the harbour entrance is fronted by a rocky reef which extends more than a cable into the channel, and 2 cables to the north-west of the point; south-eastward it extends about a cable.

The west point has 4 fathoms within a short distance of it. Southward of the west point a reef extends about a cable from the shore, as far as Yu lin kan point.

The shores of the harbour are fronted by shallow banks to distances varying from one to  $2\frac{1}{2}$  cables; there is an isolated bank in the centre of the harbour, nearly dry at low water springs.

The harbour forms the outlet of a river which falls into its north-east part, towards which the depths decrease gradually.

**Directions.**—The best time to enter is at low water, the dangers being then more conspicuous. The peak, 86 feet in height, on the northern shore of the harbour, or two white marks under it, bearing  $329^{\circ}$  true, lead through the entrance in  $4\frac{3}{4}$  fathoms water, at half a cable distant from the west point of the entrance (*see view on plan*). Haul to the westward round the west point, and anchor as convenient in about  $4\frac{1}{2}$  fathoms, near the Customs hulk.

*General charts 1342, 2062, 2661a, 1263.*

*Plan of Yu lin kan bay on 1019. Var.  $1\frac{1}{2}^{\circ}$  E.*

**Tides.**—It is high water, full and change, at 9h. 5m.; maximum mean rise about  $2\frac{1}{4}$  feet.

**Supplies.**—Water is abundant near the cocoanut trees on the south-west side of the harbour, westward of the entrance; beef and poultry are also obtainable there. The native dialect is not understood by the Cantonese.

*Chart 2062, Tong King gulf.*

**Cape Salomon** separates Yu lin kan bay from Sama bay; it is the extreme of a peninsula some 3 miles in length, attaining a height of 853 feet, and is connected with the mainland by a low isthmus.

**SAMA BAY** (*Lat.  $18^{\circ} 14\frac{1}{2}'$  N., Long.  $109^{\circ} 31'$  E.*), situated westward of Cape Salomon, has several rocks and islets in it, with anchorage in Sama port for small vessels.

East island, 3 miles westward of the cape, is 207 feet in height, with a bank of  $4\frac{1}{2}$  fathoms at about one mile south-east of it.

West island, 384 feet in height, lies 3 miles westward of East island, and is fairly wooded; a reef extends southward of it. There are some fishermen's huts on the north part of the island.

A reef with two rocky heads lies nearly midway and southward of a line joining the two islands; the passage between is not recommended.

*Plan of Sama port on 1019.*

**Sama port**, at the head of the bay, affords anchorage during the north-east monsoon period in depths of 2 to 5 fathoms, and should be approached with the high rock on the south shore westward of the village bearing  $86^{\circ}$  true, to the required depth.

A small river falls into the east part of the port, affording shelter to junks and boats.

The town of Sama is the residence of a mandarin; it is practically the market of Yu lin kan, a good road connecting the two, and is a large fishing station. Some 3 miles from Sama is a colony of Mohamedans, of whose origin little is known. An East Indian Company's vessel was wrecked here in 1819, which might be the solution. The crew possibly founded their own settlement, Ton mei koi, and by intermarrying with the Lois natives their numbers have increased to 1,000 souls. They are visited from time to time by priests from Macao.

Some rocks above water form the north side of the port, distant about 4 cables from the south point of its entrance. An islet lies 2 cables westward of the south point of the entrance; the space between is foul.

*Chart 2062, Tong King gulf.*

**GREAT CAPE** (*Lat.  $18^{\circ} 18'$  N., Long.  $109^{\circ} 11'$  E.*), situated 20 miles westward of Sama bay, is bold, and has a flat summit

*General charts 1342, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var.  $1\frac{1}{2}^{\circ}$  E.*

1,740 feet high, with a slight saddle in it. A hill, with pagoda, is situated about 5 miles eastward of the cape.

**Rock.**—A rock, awash at low water, lies  $3\frac{1}{2}$  miles south-west from Great cape, with depths of 5 to 10 fathoms between.

**Horn mountain**, before mentioned, lies about 12 miles north-east of Great cape.

**YAICHU BAY**, between Great cape and Snake point, is exposed to southerly and south-westerly winds, but affords good anchorage during the north-east monsoon in  $3\frac{1}{2}$  fathoms, about 2 miles from the beach at its head; from this anchorage to the shore the water shoals gradually.

A good position for anchoring is with Yaichu fort bearing  $24^{\circ}$  true and Mud islet in line with Button islet.

Yaichu town is the capital of an independent magistracy; it is some miles up the river, which is only navigable by boats in the rainy season. The river is barred, with 7 feet water over it, within which there is anchorage for small craft.

**Tui mui kok (Snake point)** (*Lat.  $18^{\circ}22'N.$ , Long.  $109^{\circ}0'E.$* ) has on its extreme two hummocks 90 feet in height. The high land closes the shore at this point in one or two peaks, and then recedes, and forms a background to the level plain of Yaichu, which appears to be fertile and well watered, closing the coast again at Great cape.

**Islets.**—Off Snake point are two islets; Mud islet, 223 feet high, distant 2 miles southward, and Button or Siku islet, 256 feet high, distant 3 miles to the south-westward. Maddock rock, which dries, lies 2 cables north-east of Button islet.

**Yaichu** is the principal trading place on the south coast of Hainan. At the entrance to the river, Nai Tsiu, is a bar with 7 feet water, within which is a good but small and shallow harbour.

A little way up the river, said to be only navigable for boats in the rainy season, though apparently it extends a long way north-eastward, stands the town of Yaichu, with a citadel or fort to the westward. The country is fertile and well watered.

**Winds.**—Within 5 or 6 miles of this part of the coast, the North-east monsoon blows from N.E. to E.N.E. off Yu lin kan;

“	“	“	“	N.E. to S.E. off Great cape;
“	“	“	“	light and variable off Snake point;
“	“	“	“	North to N.N.W. off South-west point;
“	“	“	“	North to N. by E. off Shoal point;

with a tendency to blow off the land at night.

*General charts 1342, 2661a, 1263.*

*Chart 2062, Tong King gulf. Var.  $1\frac{1}{2}^{\circ}$  E.*

**Reported dangers.**—Tide rips and eddies are very frequent in the neighbourhood of this coast, and their appearance has often been reported as shoals, through not investigating them at the time, by getting a cast of the lead.

**THE COAST** from Snake point trends west-north-westward for 20 miles to South-west point. The low coastline forms a long bay, fronted with sandy hillocks from 20 to 40 feet high, and with the village of Pau Ping and others.

A sandbank apparently nearly awash is charted  $260^{\circ}$  true 6 miles from Snake point, with other shallow banks nearer the shore. At 10 miles westward of Snake point the 5-fathoms contour is 6 miles off-shore, with shallow patches within. Great cape, open southward of Button islet, leads southward of these dangers.

**A patch** of  $4\frac{3}{4}$  fathoms, sand, reported in 1897, steep-to, is charted  $251^{\circ}$  true, distant 10 miles from Button islet.

**Three-tree anchorage**, 2 miles south-eastward of South-west point, affords shelter in a depth of about 6 to 8 fathoms, sandy bottom, during the north-east monsoon period, but it is open to the wind and swell at the opposite season, and is then untenable. On the coast abreast is a white pagoda surrounded by trees. Owing to the increase of vegetation, the three trees which gave the name to the anchorage are no longer discernible.

False hill, 400 feet, and Flat hill, 700 feet high, are in the foreground northward of Three-tree anchorage.

**SOUTH-WEST POINT** (*Lat.  $18^{\circ} 31' N.$ , Long.  $108^{\circ} 41' E.$* ), on which is situated Ying Khoa village, is bare and sandy, and the country is flat; but towards South-west hill to the northward foliage commences and cocoanut plantations are common.

**Ying Khoa**, on South-west point, is a large fishing village built of stone. A reef fronts the village, and there are numerous fishing stakes extending a considerable distance off it. Lights are exhibited on some of the trees here for the use of the fishermen out at night.

The people were not hospitable (1881). Landing should be effected in native boats.

**South-west bank**, two patches, with about 2 fathoms water, is situated  $256^{\circ}$  true, distant  $4\frac{1}{2}$  miles from South-west point, and is  $1\frac{1}{2}$  miles in length in a north-west and south-east direction. It breaks with a moderate swell, is steep-to on its off-shore side, and is connected by a shallow ridge to a shoal of one fathom, lying  $299^{\circ}$  true from it, distant  $3\frac{1}{2}$  miles. A patch of  $4\frac{1}{2}$  fathoms is charted

*General charts 1342, 2661a, 1263.*



*Chart 2062, Tong King gulf. Var.  $1\frac{1}{2}^{\circ}$  E.*

$285^{\circ}$  true, distant 5 miles from the one-fathom patch, or about half-way to Outer bank.

**Outer bank**, of sand (*Lat.  $18^{\circ} 37' N.$ , Long.  $108^{\circ} 23' E.$* ), lies  $288^{\circ}$  true, about 18 miles off South-west point, and is a dangerous, isolated shoal of about  $1\frac{1}{2}$  fathoms. It is steep to both northward and southward, and breaks in a moderate swell, but would not show in smooth water.

**Cométe bank** is a patch of  $4\frac{1}{4}$  fathoms, situated about 2 miles northward of the centre of Outer bank.

**Coast.—Kam yan koh or Shoal point** (*Lat.  $18^{\circ} 53' N.$ , Long.  $108^{\circ} 37' E.$* ).—From Ying Khoa village the coast trends in a general northerly direction to Kam yan koh, a distance of 22 miles; South-west hill, 690 feet in height, with a village on its south side, lies about midway between, with a hill 1,085 feet high within it. Near and northward of South-west hill are many trees, particularly the cocconut. Near Kam yan koh sand again predominates; thence to Shin chim koh, which lies 11 miles northward, there is a long sandy plain, with occasional scrub and lagoons.

**Reefs.**—Foul ground, named Kam yan sha, extends for several miles of Kam yan koh, with numerous tide-rips over and seaward of it. A patch of 3 feet is charted  $6\frac{1}{2}$  miles  $215^{\circ}$  true of the point.

Tan shin sha patches with depths of 3 and  $3\frac{3}{4}$  fathoms, are situated about 8 miles off-shore and 10 miles northward of South-west point; others may exist.

**Directions.**—If steering to the north-westward, and desirous of visiting Ying Khoa village on South-west point, steer in for Mount Etna in line with the village bearing  $40^{\circ}$  true; or if that mount is obscured, steer in with the east end of the village in line with Flat hill bearing  $49^{\circ}$  true, to avoid South-west bank.

False hill in line with the village leads on to South-west bank.

Deep water exists between South-west bank and Ying Khoa village, and it is probable there is a channel leading seaward from here, passing northward of Outer bank, but it has not been surveyed, and is, therefore, better avoided, more especially during the south-west monsoon period.

In navigating along the coast it would be prudent to keep outside a depth of 20 fathoms.

**COAST. — Aspect. — Mount Etna**, 4,967 feet high, (*Lat.  $18^{\circ} 45' N.$ , Long.  $108^{\circ} 53' E.$* ), is a remarkable mountain and a capital landmark. It shows as a precipitous crater from south-east or north-westward, but viewed from the westward it appears as a single

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. about  $1\frac{1}{2}^{\circ}$  E.*

pinnacle. Between Pyramid point and the land a few miles to the southward, Mount Etna is not visible when within 15 miles of the coast, being hidden by mountains in the foreground. The mountain ranges are continuous from the vicinity of Tai chau island, on the south-east coast, round to South-west hill, which marks the extreme of the Etna range. Several fine valleys occur, notably at the head of Yu lin kan harbour, at Yaichu bay, and westward of Snake point. From South-west hill, northward as far as Hoita, the ranges lie far inland, and although they close the coast somewhat at that port, from there they turn away eastward, leaving only detached hills between them and the north coast. See view of Mount Etna, bottom of chart 2062.

The coast northward of Kam yan koh, or Shoal point, is fronted by a shallow bank to 4 or 5 miles, but its limit is uncertain. A patch of 5 fathoms is charted 9 miles off-shore about midway between Shoal and Pyramid points, with many tide-rips in this neighbourhood.

**Shinchim koh or Pyramid point (Telanchau)** (*Lat.  $19^{\circ} 5' N.$ , Long.  $108^{\circ} 37' E.$* ), the southern limit of Bakli bay, is a low flat sandy point having a steep rock, 138 feet high, on it.

A rock, 10 feet high, lies near the coast a few miles southward of Shinchim koh.

**Anchorage.**—Shinchim koh point affords some protection for junks on either side depending on the monsoon, the anchorage being in 3 fathoms, mud. A reef fringes the shore northward of the point at a distance of 2 cables, and a depth of 3 fathoms will be obtained close up to it. The rock, 138 feet high, on the point bearing southward of  $215^{\circ}$  true clears the reef. Landing may be effected at about 6 cables eastward of the point. The place offers no supplies, but it is the only anchorage for communicating with Bakli village.

**Bakli bay**, with the village and a fort at its head, lies between Shinchim koh and Sikongsha (Segansha) point, 7 miles northward of it. A low sandy beach extends eastward from the latter point to a reef abreast the village, which covers at high water, and extends about a cable off; the depths are not more than 2 fathoms at 2 miles off-shore; shallow water is charted as extending 5 miles off Sikongsha or Segansha point. The bay is not known to afford anchorage except under Pyramid point, before mentioned, and extreme caution should be used if necessary to enter it.

**CHUN YAN BAY (Ch'aughua)** is small and shallow, with a river discharging into it by several mouths. There is the walled town of same name at 4 miles southward of Bluff point.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. about  $1\frac{1}{2}^{\circ}$  E.*

**Bluff point** (*Lat.  $19^{\circ} 21' N.$ , Long.  $108^{\circ} 41' E.$* ), 120 feet high, is bold and rocky, with 8 fathoms water close to its west shoulder and 4 fathoms off the north shoulder entering Chun yan bay. There is a high sand cliff on both faces, that on the south face falling abruptly into Chun yan bay. This declivity, kept on a bearing of  $61^{\circ}$  true, will, it is stated, allowing for the set of the tidal stream, lead between the northern and southern sandbanks off this coast.

**Banks.**—The extent of the northern bank is doubtful, and it seldom breaks, but the southern bank extends out from Sikongsha point about 5 miles, as above stated; it generally shows by the discoloration of the water, and breaks in a fresh breeze.

There is probably shelter from the south-west monsoon immediately northward of Bluff point.

**HOITA.**—From Bluff point the coast trends north-eastward for 15 miles to Hoita, commencing with a high sandy beach, and getting low and darker coloured towards the Saddle hills, which are 1,060 feet high. On both sides of Hoita the coast is foul. On the north side is a sunken reef about 3 miles in length extending three-quarters of a mile from the shore, and fairly steep-to.

The estuary of the river on which Hoita is situated is dry at low water, with the exception of a small portion in which one small vessel can lie when moored head and stern. The least water on the bar was 6 feet when last examined, the deepest water being on the village side, but it is subject to change, and the port could only be entered with local knowledge; springs rise about 9 feet.

The town is conspicuous with its white houses and junks at the anchorage; the Saddle hills are the best guide from any distance, they being the only isolated coast hills between Bluff point and Pingmar.

Hoita is the largest fishing station on the coast, and is the nearest port to the copper mines formerly worked by the Chinese. Water and an abundant supply of wood can be procured.

**Anchorage.**—There is anchorage off Hoita in a depth of 7 fathoms with the fort bearing  $114^{\circ}$  true, distant about 3 miles or more.

The coast from Hoita trends north-eastward 7 miles to Flat point, which is about 200 feet in height, whence it trends more eastward into Chappu bay.

**CHAPPU BAY** lies between Flat point and Cape Pillar, 15 miles apart, and is open to all westerly winds, but affords anchorage during the north-east monsoon.

**Tamchau reef**, situated in the centre of the bay, is about  $2\frac{1}{2}$  miles in length in a north-east and south-west direction, and has a

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. about 1° E.*

sand cay 6 feet high near its south-west extreme. The bay between the reef and the shore dangers has an average depth of 5 fathoms.

**Hiong Po (Yang P'u) harbour** (*Lat. 19° 42' N., Long. 109° 10' E.*) is a well-sheltered harbour at the head of Chappu bay, and is available for vessels of moderate draught, there being a low-water depth of about 15 feet over the bar, situated half a mile southward of the west point, with better water off Hiong Po. The entrance to Tam chau lagoon, within Hiong Po, is 3 cables wide between the forts on either side, with a depth of 5 fathoms, within which there is shelter from all winds.

**Banks.—Anchorage.**—Hiong Po point, the west side of the entrance, is a narrow peninsula  $1\frac{1}{2}$  miles in length, and covered with groups of cocoanut trees, bamboos, &c., with a reef dry at low water about a mile to the westward, with which it is connected by a bank of sand; the eastern or harbour side of the peninsula is foul to the distance of a cable only.

A sandbank, which dries 12 feet, near its north-west extreme, where it borders the channel, extends  $1\frac{1}{2}$  miles from the southern fort, reducing the channel to the harbour to a width of about 2 cables. This bank affords excellent shelter to the anchorage in 5 or 6 fathoms off Hiong Po (Yang P'u).

**Tides.**—The time of high water, full and change, is about 5h., and the rise at springs 15 feet.

**Directions.**—Coming from the north-westward, Mount Ungo, 148 feet high, bearing 143° true, leads between Tamchau reef and the reef off the west point of the entrance. When Kung chin hill is seen midway between the forts at the entrance to the harbour, bearing 69° true, steer for it, which will lead over the bar in about 15 feet at low water. When Mount Pingmar bears 35° true (in line with the right part of a group of cocoanut trees), steer for it, passing midway between the western shore and the sandbank, to the anchorage off Hiong Po; or continue along the northern shore at a distance of about a cable to the anchorage in the lagoon within the forts; just within the forts there is a depth of 7 fathoms, but how far the deep water extends is not stated. The lagoon, however, is said to be encumbered with sandbanks. A pier is being built in it by the Chiao Hsing Mining Concession (1910).

The tidal streams run with considerable strength at springs, therefore towards low or high water would seem to be the best time to enter the harbour. It could not be entered without a plan, unless with local assistance.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. about 1° E.*

**Hiong Po (Yang P'u)**, on the north side of the approach to the lagoon, is a fishing village. Many junks are anchored off here at times.

**Tamchau**, situated about 6 miles above the head of the lagoon on the south bank of the river, is one of the most important trading places in Hainan.

**Cape Pillar** (*Lat. 19° 47' N., Long. 109° 9' E.*), the north point of approach to Chappu bay, is the extremity of a range of red bare hills, and has a peculiar pillar rock on it. Two islets, named the Thumb and the Mandarin's cap, the latter 40 feet high, lie on the reef fronting the coast, which is steep-to. A pagoda stands near the point.

**The coast.**—From Cape Pillar the coast is low and sandy, with cocoanut trees to Pingmar point, a steep coast cliff surmounted by a two-peaked hill. A reef fronts it to the distance of about three-quarters of a mile for about 4 miles from Cape Pillar; the remainder is apparently free from danger beyond a short distance. For landmarks, *see* page 335.

**HAU SUI BAY** lies between Pingmar point and the point below Lamko hill, south side of western approach to Hainan strait, and is about 12 miles wide.

**Reefs.**—A reef, dry at low water, and about 4 miles in length, occupies the centre of the bay, and is steep-to on its north side; on its inner or south side is a sand cay, named Chung kwan yan, only a little above high water.

A coral patch, which dries about 6 feet, lies half a mile south of the sand cay. There is a patch which dries about 3 feet at  $1\frac{1}{2}$  miles west of the village of Hau sui.

**Directions.—Anchorage** (*Lat. 19° 53' N., Long. 109° 26' E.*).—Good sheltered anchorage at all seasons may be obtained within the long detached reef, by small craft, in 4 fathoms, at half a mile south-westward of the sand cay. To enter the bay from the westward, steer in with Kung chin hill bearing 170° true until the sand cay bears 91° true, when haul up, with it a little on the port bow, anchoring as above. To enter from the eastward, steer in with Kung chin hill bearing 213° true, anchoring as requisite; if wishing to anchor under the reef, as before mentioned, haul to the westward when southward of the patch which dries, situated southward of the sand cay, thence as requisite.

**The village** of Hau sui is on the east side of the bay, at the entrance to the creek.

*General charts 2661a, 1263.*

*Chart 2062, Tong King gulf. Var. about 1° E.*

**Hau sui creek**, at the south-east extreme of the bay, has depths of 2 to 3 fathoms, with good shelter for junks and other light craft within. Sandbanks extend a mile or more south-westward of the village and the south point of entrance, leaving only a narrow channel about dry at low water springs. A large number of junks use the creek and the anchorage outside; it can only be entered at high water with local knowledge.

### HAINAN STRAIT.

*Chart 876, Hainan strait. Var. 0° 50' E.*

**GENERAL REMARKS.**—**Hainan strait**, situated between the north coast of Hainan island and the south coast of Lei chau peninsula, is about 50 miles in length east and west, and from 10 to 14 miles in breadth; it has numerous sandbanks extending in a north-easterly direction for a distance of about 25 miles from its eastern entrance, and a few isolated banks in its western entrance.

There are three entrances from the eastward, namely, the North, Middle, and South channels, all with deep water.

The South channel, or Inner passage, page 343, being near the shore, though narrow, is chiefly used; it is buoyed, and should always be taken in thick weather.

Middle channel is strongly recommended in clear weather. *See* page 350, proceeding eastward.

North channel is not recommended when coming from the eastward.

There is an in-shore passage north-eastward to Nau chau available for vessels of light draught in charge of a pilot. *See* page 347.

The western entrance is common to them all.

**Directions.**—For banks in the western approach and directions for the strait, *see* pages 348-352.

**Landmarks.**—Approaching Hainan strait from the westward, the following hills form useful landmarks for ascertaining the position of a vessel; and on a nearer approach those mentioned on page 350, with the directions.

**Mounts Pingmar.**—About 4 miles within Pingmar point, page 334, are Mounts Pingmar, two conical peaks about a mile apart, and about 656 feet in height, capital landmarks, in lat. 19° 51' N., long. 109° 17' E.; there is a pagoda on the highest, but it cannot easily be made out.

**Kung chin.**—At 7 miles east-south-east of the Pingmar mounts, is the wooded, conical hill Kung chin, 683 feet high, standing isolated in the plain.

*General charts 2062, 2661a, 1263.*

*Chart 876, Hainan strait. Var. 0° 50' E.*

**Limkou** or **Lamko hill**, 614 feet in height, about 20 miles eastward of Mounts Pingmar, has a summit somewhat flat with two little peaks. The village of Limkou lies about 2 miles eastward of it.

**SOUTH SHORE.**—**Lamko point** may be considered to be the south-west point of Hainan strait; it is distant about 17 miles south-westward from Cape Kami, which forms the north-west point of the strait.

**Reef.**—From Lamko point westward, to the entrance to Hau sui bay, the shore is fronted by reef, dry at low water to a distance of about half a mile, outside which shallow water, less than 3 fathoms, extends  $1\frac{1}{2}$  miles off-shore in places; it should not be approached within a depth of 10 fathoms, or to a less distance than 2 miles.

**Reported reef.**—A reef, depth not stated, has been reported in lat.  $20^{\circ} 2' 40''$  N., long.  $109^{\circ} 36' 5''$  E., or  $6\frac{1}{4}$  miles  $290^{\circ}$  true from Lamko point lighthouse. It is charted as a rock with less than 6 feet, outside the 10-fathoms contour line. Position extremely doubtful.

**LIGHT** (*Lat.  $20^{\circ} 0'$  N., Long.  $109^{\circ} 42'$  E.*).—From an iron tower on piles, 67 feet high, painted white, with two red horizontal bands, situated about 250 yards within Lamko point, is exhibited, at an elevation of 63 feet above high water, a *flashing white light every twenty seconds*, visible from a distance of 13 miles in clear weather. The light-keeper's dwellings are white.

**Coast.**—Eastward of Lamko point is a bay 6 miles wide, with depths of 7 to 8 fathoms in the entrance, shoaling gradually towards the shore. There is a harbour suitable for junks in its south-east corner, with a small fort on the west point of the entrance.

Western cap, a hill 46 feet high, is near the western shore of this bay, one mile south-east of Lamko point.

**Maniu harbour** (*Lat.  $19^{\circ} 58'$  N., Long.  $109^{\circ} 51'$  E.*) is situated about 8 miles eastward of Lamko point. Its entrance, between Hong pi kok and the islet off Sad point, is  $3\frac{1}{2}$  miles wide, with depths of about 5 fathoms; within Pao yu point the depths are under 3 fathoms, rapidly shoaling to the shore. A small fort marks the head of the harbour, and near it is a creek, up which small junks entering at high water find shelter. Eastward of Hong pi kok, the bottom is foul and shallow for the distance of one mile, and there is a patch of 5 fathoms between this foul ground and Sad point islet, off the east extreme of the harbour.

The land around and at the back of Maniu harbour is low, and well-cultivated.

**Anchorage.**—Good shelter will be found in Maniu harbour from easterly winds, in 4 fathoms, blue clay, half a mile northward of Pao

*General charts 2062, 2661a, 1263.*

*Chart 876, Hainan strait. Var.  $0^{\circ} 45' E$ .*

yu point, with Sad point islet bearing  $21^{\circ}$  true. There is also good anchorage during westerly winds in the western part of the harbour, in about the same depth.

**Magpie point.**—From Sad point the coast trends eastward for about 3 miles, in a line of red cliffs, to Magpie point, rendered conspicuous by a detached piece of cliff 48 feet high off it. These cliffs, which are steep-to, range from 50 to 60 feet in height, and the black lava underlying the soil appears like a high-water mark.

**CHING MAE BAY** lies between Magpie and Ching mae points. The head or south-west corner is marked by Fah yung, a hill 200 feet high, which overlooks a lagoon that affords shelter to junks, and extends for some miles inland.

About 6 or 7 miles inland are two extinct craters, named the Hummocks, 564 and 705 feet in height, and visible about 25 miles in clear weather. Between Fah yung and the Hummocks stands Tong sui mun, a solitary hill, 470 feet high.

The land is low around this bay, rising gradually towards the Hummocks; the country is fertile and well cultivated, and the beach is fringed with trees and bushes.

**Bank.**—The head of the bay, between Magpie and Tong sui points, has a sandbank, with as little as 4 feet water, extending for a distance of 4 miles east and west within the 3-fathoms line, leaving a channel between it and the points, as charted.

From Tong sui point, for a distance of 4 miles to the eastward, the shallow water extends a mile from the shore.

**Fishing stakes.**—There are several fishing villages in the eastern part of the bay, and the nets, some of which are floating and some fixed, barricade the shore for a considerable distance.

**Anchorage.**—Good anchorage may be obtained in the south-west part of Ching mae bay, in a depth of  $3\frac{1}{2}$  fathoms, mud, about a mile  $338^{\circ}$  true of Shak ket long fort; and in the eastern part about three-quarters of a mile south-west of the village near Ching mae point, in 4 fathoms, mud, passing in between the two sets of fishing stakes, where an opening is usually left for the trading junks; at any rate avoid fouling them.

This village, built of black bricks or lava, forms a conspicuous dark patch against the sandhills.

**The town** of Ching mae is situated about  $1\frac{1}{2}$  miles within the shore of the bay, 5 miles southward of Ching mae point.

**Ching mae point** (*Lat.  $20^{\circ} 4' N.$ , Long.  $110^{\circ} 10' E.$* ), the eastern limit of Ching mae bay, is low and sandy, with shallow water extending

*General charts 2062, 2661a, 1263.*



*Chart 876, Hainan strait. Var.  $0^{\circ} 45'$  E.*

nearly a mile off it. The point is difficult to distinguish after dark, as the hills stand so far back; it is better therefore to give it a wide berth in passing, and trust to making out vessels' lights for a guide into Hoi hau bay.

Fishing stakes extend from this point for a distance of about a mile.

*Plan 37, Hoi hau bay.*

**Mandarin's cap**, a remarkable cone-shaped mound, within the eastern part of Ching mae point, about half a mile from the beach, is a conspicuous object, and forms the west extreme of a range of sand-hills from 70 to 80 feet high.

**HOI HAU BAY** (*Lat.  $20^{\circ} 4'$  N., Long.  $110^{\circ} 17'$  E.*), situated between Ching mae point and Baksha point,  $8\frac{1}{2}$  miles eastward of it, is nearly all shallow.

**Dale banks.**—Depths of less than 3 fathoms extend in a tongue for about three-quarters of a mile north-west of a line joining those points; the shallow portion just within the edge, which has depths of 7 to 9 feet, and the patches eastward of it, with depths under 12 feet, are named Dale banks. Banks of sand and mud, with sand islets in places, extend  $1\frac{1}{2}$  miles off the shore abreast Hoi hau, on the eastern side of the bay.

**Baksha, or Hoi hau point**, is low and sandy, with occasional hillocks and patches of green scrub. The village of Baksha, a cluster of houses built of lava and black bricks, is situated about three-quarters of a mile back from the low water mud-flats, and about a mile southward of the point. Fishing stakes extend about 2 miles off Baksha point, into 8 and 9 fathoms water, at times.

Sand and mud-flats, almost covered at high water, front the coast south-westward of the point, with shallow channels between, leading to Baksha and Hoi hau; these flats are subject to change during bad weather.

**Aspect.**—The land in the neighbourhood of Hoi hau is low, and appears well wooded; midway between Ching mae point and Hoi hau there are some red cliffs, with barren sandhills on the west, and wooded hills, 50 to 60 feet high, on the east side. An obelisk, with a fort near it, lies on the shore to the eastward of the wooded hills. There are two remarkable palms eastward of Baksha village. Kiung chau pagoda, 154 feet high, north-eastward of the capital, forms a good landmark, but is hidden by trees for a certain distance eastward of Baksha point, reappearing again apparently when abreast the point.

*General charts 2062, 2661a, 1263.*

Plan 37, Hoi hau bay. Var.  $0^{\circ} 45' E$ .

**LIGHT** (Lat.  $20^{\circ} 1' N.$ , Long.  $110^{\circ} 16' E.$ ).—From a cylindrical iron tower, 22 feet high, painted white, situated near the head of Hoi hau bay, is exhibited, at an elevation of 73 feet above high water, an *alternating white and red group flashing light*, with a period of *forty-five seconds*, visible from a distance of 10 miles in clear weather. The light shows three *white flashes* followed by a *red flash*, thus:—*white flash, one and a half seconds; eclipse, six seconds; white flash, one and a half seconds; eclipse, six seconds; white flash, one and a half seconds; eclipse, thirteen and a half seconds; red flash, one and a half seconds; eclipse, thirteen and a half seconds.*

The lighthouse itself is difficult to make out, as it stands in front of a low white building, which latter is easily seen.

**Anchorage.—Directions.**—The anchorage in the eastern part of Hoi hau bay is partially protected by Baksha sand flats, especially for small craft and junks anchored well in towards the river, but it is open from N.E., round by north, to West.

Coming from the eastward, after rounding the fishing stakes off Baksha point, a course  $206^{\circ}$  true for the Hummocks will lead to the anchorage; when Kiung chau pagoda bears  $130^{\circ}$  true anchor in a depth of 4 fathoms. A heavy and confused sea gets up here at times, but the holding ground is said to be good, a mixture of mud and sand.

Vessels from the westward steer for Baksha point, bearing southward of  $91^{\circ}$  true until Kiung chau pagoda bears  $130^{\circ}$  true, when it should be steered for, anchoring when the Hummocks bear  $209^{\circ}$  true, as before.

Junks and other small craft usually anchor about 2 miles farther inshore, in about 10 feet,  $1\frac{1}{2}$  miles north-eastward of the light.

Landing or embarking cargo is greatly impeded by the long mud-flats stretching off Hoi hau town. The facilities for transshipment are not good, owing to the necessary small size of the cargo boats from want of sufficient depth in the channel to the town.

**Tides and tidal streams.**—It is high water, full and change, at Hoi hau, at 7h.; springs rise from 6 to 10 feet. Time and height is very irregular.

The flood makes to the north-east for about 16 hours, the ebb to the south-west for about 8 hours; velocity  $1\frac{1}{2}$  or 2 knots an hour. In like manner the tidal stream through Hainan strait sets to the westward for 16 hours, to the eastward for about 8 hours; greatest strength 2 to 3 knots an hour. On the Hainan shore the stream is said to turn an hour earlier than in the offing. See pages 352 and 353.

**Hoi hau river.**—The entrance of Hoi hau river is between two whitewashed forts. At low water the shallow flat-bottomed native

*General charts 2062, 2661a, 1263.*

*Plan 37, Hoi hau bay. Var. 0° 45' E.*

boats cannot enter, but large junks are taken up for repairs at high tides.

The shore on both sides of the channel is broken up into a succession of islands by various creeks leading into the river. On the north side, approaching the Customs jetty, are the Standard Oil Company's godown, that of Messrs. Schomberg & Co., and the French Consulate; on the south are the German Consulate and other foreign residences and Honges. On a creek are the British Consulate, the Commissioner's house, the American mission, &c. The land in the vicinity is very flat and low, the buildings being hemmed in by creeks to the north-west. On the east is a mass of native houses adjoining the walled town of Hoi hau. To the south and west are creeks, salt-pans, and paddy fields which cut off the foreign houses from the ridges which rise to 40 or 50 feet all round, utilised as positions for forts. Near the river is a pagoda 150 feet in height.

Craft of 2½ feet draught can proceed to Fahi, a market town of 2,000 inhabitants, the usual terminus of the traffic on this river, 42 miles from Kiung chau fu. There are wattle dams in places, opened for craft to pass through. The river rises from 6 to 8 feet in the rainy season, but not more than 3 feet can be depended on in the openings in the dams.

**HOI HAU** is the seaport and treaty port of the city of Kiung chau (the seat of Government in Hainan island, and distant from its port about 3½ miles), which was opened to foreign trade in 1876. Vessels, on account of the shallowness of the bay and river, are compelled to anchor from 3 to 4 miles from the town.

*See General remarks, pages 314, 315.*

**Population.**—The town of Hoi hau contains about 12,000 inhabitants, and has a governor; the population of Kiung chau is about 35,000.

A British Consul resides here.

**Trade.**—The principal exports comprise pigs, sugar, grass cloth, betel-nuts, seeds, sesamun, eggs, fish, and ground nut cakes; rubber cassia, camphor, and tobacco could be remuneratively cultivated. The imports consist of opium, rice, cotton yarn, shirtings, flour, kerosene, ginseng, Japanese matches, vermicelli, &c. The value of the imports in 1911 amounted to 3,078,264 Hk. taels, and exports to 2,106,679 Hk. taels.

Most of the exports are brought from up river by the trading junks and boats. There was a considerable falling off in trade in 1910; only 934 vessels entered and cleared.

*General charts 2062, 2661a, 1263.*

*Plan 37, Hoi hau bay. Var. 0° 45' E.*

In the year 1911, 387 steam vessels entered the port, of 363,421 aggregate tonnage; of these 64 were British, and 273 German. One Chinese sailing vessel entered, of 123 tons, besides junks.

Under inland navigation rules 6 small vessels (French) entered, of the aggregate tonnage of 768 tons.

**Communication.—Telegraph.**—There are three or four lines of steam vessels running to Hong Kong and Pakhoi, &c., at intervals of a few days, and also to Haifong, Tourane, Singapore, and Bangkok. The bi-monthly steamers between Kwang chau wan and Haifong call here. The China-Siam steam vessels also call here. There are three separate postal systems, viz., the British Postal Agency, the French Imperial Post Office, and the Imperial Chinese Post. There are branch offices at important places.

There is a wireless telegraph station at Hoi hau, connecting with Hsu wen on the mainland, about 13 miles distant, said to be constantly out of order; typhoon warnings often come after the storm has passed.

A land line connects Hoi hau with Kiung chau fu, the capital, 4 miles distant.

**Supplies** are fairly plentiful, prices moderate; notice to procure them is required. Water is brought off in water boats, and reported (1903) to be of good quality.

**Coal.**—Messrs. Schomberg, the agents for Messrs. Butterfield and Swire, keep a supply of 100 tons, other firms about 200 tons, and the Chinese Government from 100 to 200 tons; it is shipped from lighters at the anchorage.

**Winds.**—Hoi hau is frequently visited by hard squalls, lasting only a few minutes, but with such force as to be very destructive to small craft.

**Temperature.**—During June at Hoi hau the temperature on the deck in the shade was 95° between noon and 3 p.m., and 83° at night, *see* pages 317, 318.

**Climate.**—As regards health, Hoi hau compares favourably with other parts of Hainan, though fever and ague prevail to some extent.

*Chart 876, Hainan strait.*

**POCHIN BAY** lies between Baksha and Pochin points, and affords good anchorage.

The coast from Baksha point to Pochin lagoon at the head of the bay, is low and sandy, intersected by creeks and backed by trees from 1½ to 2 miles inland; from the lagoon to Pochin point it is fronted by reefs, with small heads from 3 to 4 feet high. Po chin river discharges at about 2 miles eastward of Baksha point; its mouth is appa-

*General charts 2062, 2661a, 1263.*

*Chart 876, Hainan strait. Var. 0° 40' E.*

rently dry at low water. Probably at high water boats could proceed to Hoi hau by it, but we have no information on this point.

**Baksha banks** extend  $9\frac{1}{2}$  miles in an east-north-east direction from Baksha point, or about half-way across the entrance to Pochin bay; about midway a portion dries one foot at low spring tides. Nearly one mile within the east extreme of the banks there is but one foot of water; the western part may be crossed in  $2\frac{1}{2}$  fathoms at low water, about 3 miles from Baksha point. Numerous fishing stakes are on the banks and in Pochin bay. These banks shelter Kiung chau roads.

**Pochin point** is composed of sand, with a reef extending half a mile off and steep-to; a rock, 10 feet high, lies within its western extreme.

From the north side of the point a shallow ridge extends nearly a mile northward, with a patch of 6 feet within its extreme. The shore eastward is rocky, with shallow patches at half a mile off.

**Pochin hill or Seven Star mount** (*Lat. 20° 5½' N., Long. 110° 36' E.*).—Pochin hill, situated  $1\frac{1}{2}$  miles within Pochin point, has seven peaks (but seldom more than four are visible at the same time), the highest of which, 459 feet high, has on it a pagoda.

**Directions.—Anchorages.**—There is a good holding ground in a depth of 6 fathoms, sand and mud, south-eastward of Baksha banks, with Pochin point rock bearing 91° true, distant  $1\frac{1}{4}$  miles.

Also in about 3 fathoms for small craft off Pochin lagoon, with Pochin point rock bearing 46° true, distant 3 miles; but these are not at all protected from northerly winds, and consequently a sea soon gets up.

The best anchorage in bad weather is in Kiung chau road, which lies southward of the Baksha banks, in about  $4\frac{1}{2}$  fathoms, stiff mud, with Pochin pagoda bearing 88° true and Kiung chau pagoda 226° true, or the Hummocks, if visible from here, 234° true. H.M.S. *Maggie* rode out a typhoon at this anchorage, being protected by the banks.

Approaching from the eastward, when within Pochin point, the extreme of Baksha point bearing 271° true will lead to this anchorage. The western entrance, within Baksha banks, is only available with local knowledge.

**Pochin lagoon and village.**—Pochin lagoon is fronted by a bar to the distance of about 2 miles, nearly dry at low water, and with about 10 feet at high water, at which time it is available for junks and other light craft. Abreast the village, within the fort on the east side, there is a low water depth of about 3 fathoms, decreasing again in the lagoon. The large trading junks from Singapore and China lie

*General charts 2062, 2661a, 1263.*

*Chart 876, Hainan strait. Var. 0° 40' E.*

here waiting the change of the monsoon, or during typhoon weather. The village of Pochin is small and unimportant.

**Hainan bay.**—The coast from Pochin point curves gradually north-eastward to Hainan head, with Hainan bay between, which affords anchorage in a depth of 7 fathoms at about a mile south-west of the Bluff. At one-third of a mile westward of Hainan bluff is a rock 7 feet high, with another rock, 2 feet high, at about the same distance northward of it. The bay is foul to the distance of about three-quarters of mile off-shore, with rocks above water in places. A rock, 10 feet high, lies half a mile off-shore westward of the head of the bay, and is foul to a somewhat greater distance as far westward as Pochin point, before mentioned.

The shore of the bay is sand, backed by sandhills from 50 to 70 feet high, and covered with scrub, with a tree here and there.

**LITTLE BANK** (*Lat. 20° 12' N., Long. 110° 37' E.*—Northward of Hainan bay lies Little Bank, on the western side of Hainan head. Within a depth of 5 fathoms it is about 2 miles in length in an east and west direction. Near its west end is a patch of  $1\frac{3}{4}$  fathoms, and at its east extreme one of 3 fathoms, with Hainan bluff bearing 130° true distant 4 miles from the first-mentioned patch.

*Plan of Inner passage on 876.*

**HAINAN HEAD (Lao Hu Shan).**—Hainan head, the north extreme of Hainan island, is composed chiefly of sand, and attains a height of about 180 feet at one mile within the point; it is covered with short scrub, almost to the water, which continues for about one mile to the south-east, where vegetation ceases, except a few isolated green patches.

Hainan bluff, its north-west extreme, is a flat-topped mound, 173 feet high.

**INNER PASSAGE**, the western entrance to South channel, between Hainan head and the banks eastward of it, is buoyed, and the channel recommended for vessels passing through Hainan strait in thick or hazy weather.

**Directions.**—*See page 352.*

**Dangers.**—A rocky ridge, dry 4 feet at low water, at its extreme, extends half a mile north of Hainan point. Detached rocks skirt the shore at half a mile distant for  $1\frac{1}{2}$  miles in a south-easterly direction from the point.

The bottom is foul and rocky northward of Hainan bluff, within the 10-fathoms contour line; a patch of  $4\frac{1}{4}$  fathoms has been found (1912) at a distance of  $6\frac{1}{2}$  cables, 334° true, from the bluff, with a patch of  $3\frac{3}{4}$  fathoms at  $1\frac{1}{4}$  cables, 206° true, from the  $4\frac{1}{4}$ -fathoms patch.

**Magpie rock**, a pinnacle, with 3 feet water, is situated near the extreme of a spit at  $1\frac{1}{2}$  miles 142° true from Hainan point, and half a

*General charts 2062, 2661a, 1263.*

*Plan of Inner passage on 876. Var. 0° 40' E.*

mile from the shore; there is a rock awash at low water about midway between.

**Riversdale patch**, of  $2\frac{1}{2}$  fathoms, lies 4 cables  $46^\circ$  true of Magpie rock.

**A bank**,  $2\frac{1}{2}$  miles in length, with a least depth of  $1\frac{1}{2}$  fathoms, lies south-eastward of Magpie rock. Its south-east extreme is about 2 miles off-shore, and has a depth of  $2\frac{1}{2}$  fathoms.

The sandy point, 89 feet high, situated 8 miles south-eastward of Hainan point, is fronted by a rocky ridge, dry at low water to the distance of a mile, with a rock, 2 feet high, on it; the ridge extends under water for the further distance of a mile, fairly steep to beyond. Eastward of this point is a sandy bay, beyond which the coast is fronted by reef and foul ground to the distance of 2 miles, decreasing to about one mile off Mofu point. (*Chart 876.*) (For Mofu point and coast southward, see page 324.)

The preceding dangers form the western and southern sides of Inner passage and South channel, the channel between them, and Hainan head bank, with depths over 5 fathoms being about half a mile wide.

**Hainan head bank** forms the eastern side of Inner passage. It is about 9 miles in length in an east-south-east and opposite direction, within a depth of 5 fathoms, and is steep to on the north side, but its southern or channel side has several detached patches near its 5-fathoms contour. The nearest patch to Hainan point,  $1\frac{1}{2}$  fathoms, is distant  $1\frac{1}{2}$  miles. One spot dries 3 feet at low water springs at  $2\frac{1}{2}$  miles from its west end.

The deep bight on the south side of the bank has apparently filled up, as shallow water has been reported nearly out to the 2 fathoms below mentioned.

**A patch** of 2 fathoms, hard sand, was reported by the *Hanoi* in 1896, to exist on the 10-fathoms contour line, on the south side of the bank, distant  $1\frac{6}{10}$  miles eastward of Magpie rock, or with Hainan point bearing  $295^\circ$  true, distant  $2\frac{8}{10}$  miles; it should be given a berth.

**Buoys.**—A black buoy, with ball, marks the reef extending northwards off Hainan point, in about 10 fathoms water. A black buoy, with triangle, marks the north side of Riversdale patch, situated north-eastward of Magpie rock. A red buoy, with an inverted cone, is moored 3 cables westward of the  $1\frac{1}{2}$ -fathoms patch, within the 5-fathoms contour of the west end of Hainan head bank, and lies with Hainan point  $249^\circ$  true, distant about 7 cables. The pilots have stone beacons as direction lines on Hainan point, by which they know if the buoys are out of position. If not, they are attended to, but are not to be altogether relied on.

A wreck (1909) lies eastward of the  $1\frac{1}{2}$ -fathoms patch, as charted.

**Directions.**—See page 352.

*General charts 2062, 2661a, 1263.*

*Plan of Inner passage on 876. Var. 0° 40' E.*

**Anchorage.**—At 5 miles south-eastward from Hainan point there is anchorage in a depth of 8 fathoms, mud and sand, at the distance of 2 miles off-shore, which is slightly protected by Hainan head bank.

**Tides.**—It is high water, full and change, at Hainan bluff, at 10h. 35m.; springs rise 6 feet, neaps 4 feet. There are two high and two low tides in the 24 hours, which are regular at full and change, but not so near the neaps. The flood stream generally runs for about 12 hours, as also does the ebb stream (there being hardly any slack water); the latter commences between the fifth and sixth hour after high water by the shore. The velocity is from 4 to 5 knots at springs off the bluff; *see* tidal streams, pages 352, 353.

*Chart 876, Hainan strait.*

**HAINAN STRAIT.**—North shore.—**Lei Chau peninsula** (*continued from page 313*).—**Tong Chong, or Safe bay**, lies on the west side of Lei Chau peninsula, between Cape Kami and Nau sa point. It is about 5 miles in length, fronted by reef and shallow water to the distance of about half a mile, and with a depth of 5 fathoms, mud, from one to  $1\frac{1}{2}$  miles off-shore. The bay affords shelter with winds from N.W., round by north and east, to about South. There is an islet with a few trees, near the north-west point of the bay, and a few villages to the eastward of it. Its shores are level and cultivated, with sandy beaches in places and clusters of trees.

**CAPE KAMI**, the north-west point of entrance to Hainan strait, is the south-west extreme of a sand islet about 40 feet in height, situated about half a mile within the edge of the reef, which extends nearly 2 miles south-west of the mainland.

**LIGHT** (*Lat. 20° 13' N., Long. 109° 55' E.*).—From an iron tower, on piles, painted white, with a black horizontal band, erected 83 yards from the extreme of Cape Kami, is exhibited, at an elevation of 67 feet above high water, a *group flashing white light*, showing *two flashes* in quick succession *every thirty seconds*, and visible from a distance of 13 miles in clear weather.

The lightkeepers' dwellings are white.

**A rock**, with 6 feet water, and 2 fathoms around, lies on the south extreme of the reef, distant one mile south-south-west from the lighthouse, and a patch of 3 fathoms lies about  $1\frac{1}{4}$  miles west-south-westward of the lighthouse. There are considerable overfalls for some distance outside the rock, which is steep-to.

A ridge, with  $4\frac{3}{4}$  fathoms, lies south-eastward, distant  $2\frac{3}{4}$  miles from the lighthouse.

For banks in the approach, *see* page 348.

*General charts 2062, 2661a, 1263.*



*Chart 876, Hainan strait. Var. 0° 40' E.*

**Anchorage.**—Good anchorage may be obtained, with shelter from north-west winds, in a depth of 5 fathoms, mud, with Cape Kami light-house bearing 277° true, distant  $1\frac{1}{2}$  miles; and from north-east winds, in 9 fathoms, mud, with Cape Kami bearing 128° true, distant  $1\frac{1}{2}$  miles.

**Tides.**—It is high water, full and change, during the summer, at Cape Kami, at 2h. 45m. p.m., and during the winter at 2h. 45m. a.m.; springs rise  $9\frac{3}{4}$  feet, neaps rise 7 feet. They are single day tides, one high water only in 24 hours, and regular except at neaps, when for about three days they are double and irregular; *see also* pages 339, 352, and 353.

**Kami bay**, situated east of Cape Kami, is 11 miles wide, fringed by reef from a half to  $1\frac{1}{2}$  miles off-shore, and is shallow, the 3-fathoms line being at an average distance of 3 miles from the shore; it presents no features of interest. The eastern part rises gradually to the Shenwen range, but the western part is low, consisting of sandhills topped with bush, which become bare as Cape Kami is approached.

**Islet point** is the eastern limit of Kami bay, off which there are several islets, one of which is 20 feet in height; shallow patches, with as little as one foot water, extend for a distance of 2 miles south-westward of the fort on Islet point.

**Three-fathoms patch.**—The outer danger off Islet point is the Three-fathoms patch, situated 226° true, distant 3 miles from Islet point fort. There are heavy overfalls in the vicinity of this bank, and vessels should not attempt to pass inside of it, as there are other patches with less water there.

**Palm point.**—From Islet point, the coast trends eastward  $3\frac{1}{4}$  miles to Palm point, the west extreme of Hai an bay, rendered conspicuous by several trees; shallow water extends off the point for a distance of half a mile.

**Shenwen range** (*Lat. 20° 20' N., Long. 110° 7' E.*), about 3 miles in length in an east and west direction, attains a height of 510 feet, and is conspicuous from the westward. South-eastward of it is Shenwen pagoda, 385 feet above the sea.

**HAI AN BAY** lies between Palm point and a projecting point with a conical mound, 60 feet high, south of which, on the reef surrounding the point is an islet 4 feet high.

The bay is shallow, the one-fathom line extending one mile from the shore and nearly straight between the entrance points, affording little shelter except from northerly winds.

*General charts 2062, 2661a, 1263.*

*Chart 876, Hainan strait. Var. 0° 45' E.*

Hai an village (*Lat. 20° 17' N., Long. 110° 14' E.*) lies near the centre of the head of the bay, with an inlet north of it. Baksha village is situated in a white sandy bay, nearly 3 miles east of Hai an.

**Hongham bay.**—From Hai an bay to Hongham bay, situated 6 miles north-eastward, the coast is formed of sandhills surmounted by patches of scrub; it has not been surveyed.

**Anchorage.**—There are two good anchorages during northerly winds on the north side of the strait; in Hai an bay, with the white fort at Hai an bearing 338° true distant  $1\frac{1}{2}$  miles, in a depth of 5 fathoms, mud; and in Hongham bay, with the east point of that bay bearing 68° true distant  $1\frac{1}{2}$  miles, in 7 fathoms, mud.

**COAST.—Gopai point.**—From Hongham bay the coast trends north-eastward for about 12 miles, to Gopai point, the eastern extreme of Lei chau peninsula. Mound point lies 2 miles south-west of it, faced by a steep cliff. The mound on it is 160 feet in height. For 3 or 4 miles southward of this mound, reef extends about 3 miles off-shore; from thence to Hongham bay the coast has not been examined; the neighbourhood should be avoided unless locally acquainted or in charge of a pilot.

**Black rocks** (*Lat. 20° 29' N., Long. 110° 33' E.*), a group about a mile in extent, are situated about  $1\frac{1}{2}$  miles north-eastward of Gopai point; one of them is 4 feet high. Eastward of these rocks, about 2 miles, is a line of breakers extending north and south, the latter extreme being 3 miles 147° true of Black rocks. The in-shore passage, here called Gopai narrows, lies between Black rocks and the breakers.

**La tao sah (Sheldrake sand cay)**, about 7 feet in height, is on the eastern or seaward side of the in-shore channel to Nau chau, below mentioned. It is situated about 5 miles south-eastward of Mound point, with other cays or banks, San sah and Kan sah, close westward of it; it is charted as being about 5 miles in extent, with shallow water extending some 2 miles southward of it. Shallow banks continue about 11 miles or more north-eastward, northward of the Seal banks, but they have not been properly surveyed.

**Malu hau** is a port on the east side of Lei chau peninsula, protected by a bar with a depth of 4 feet at low water spring tides. It has a good trade in sugar and oil. It is approached from the southward by the in-shore channel below mentioned.

To the eastward of Malu hau are extensive flats, which have not yet been thoroughly surveyed.

*Charts 876, 2062.*

**IN-SHORE or MALA HAU PASSAGE.**—North-eastward of Hongham bay, before mentioned, along the northern shore of

*General charts 2062, 2661a.*

*Charts 876, 2062. Var. 0° 45' E.*

Hainan strait, is the Malu hau passage leading to Nau chau island, available at high water, with local knowledge, for vessels of about 12 feet draught. A pilot is probably obtainable at Hoi hau, though too much reliance should not be placed in him. The following remarks may be of some use as a check on the pilot.

The entrance from the southward is between Sheldrake sand cay and Lei chau peninsula, thence close eastward of Black rocks situated northward of Gopai point. The chart affords but little guide, as the channel has not been surveyed. Anchorage may be taken about a mile south-east of the Black rocks, in about 6 fathoms, if waiting for tide.

Northward of Black rock the channel is over sand-flats, which have as little as three-quarters of a fathom at low water springs, or about 16 feet at high water springs. The channel is very narrow, apparently, though deep, 5 to 7 fathoms, when Malu hau bears 249° true, and the banks are numerous; farther northward the channel is between Lui ta sah and Tong sah banks, with (according to the chart 2062) about 1½ to 3 fathoms water. When north-eastward of this bar, Nau chau island may be steered for, about 356° true, and when about 7 miles from it the vessel will be in the Surprise pass, leading to Nau chau, and in surveyed ground. (*Chart 3349*).

Mount Kam Lung, 900 feet in height, on the peninsula, may be useful in checking the position of the vessel, but its position may be doubtful.

**Tidal streams.**—In the Malu hau channel the flood sets northward and the ebb southward, but off the entrance to the Malu hau river they set strongly across the channel on both tides; adding to the difficulty and danger of the navigation. Where the Malu hau and Hainan strait streams meet there are sometimes eddies which have the appearance of breakers.

The maximum strength of the stream that has been observed is 2½ knots. See tides at Nau chau, page 359; also streams in Hainan strait on pages 252, 253.

*Chart 876, Hainan strait.*

**BANKS in and near the fairway. — Western approach.**—The westernmost bank in the approach to Hainan strait is a narrow ridge of sand 9 miles in length, east and west, and one mile in breadth, within the 5-fathoms contour line, with the shoalest spot, 3 fathoms, 1½ miles from its west end, situated with Cape Kami light-house bearing 80° true, distant 30 miles; it is fairly steep-to.

A bank of sand 2 miles in extent east and west, and about a mile or more wide at the western end, with a depth of 4 fathoms on its shoalest part, lies with Cape Kami bearing 94° true, distant 18 miles from that extreme.

*General charts 2062, 2661a.*

*Chart 876, Hainan strait. Var. 0° 50' E.*

The French ironclad *Vauban*, in 1898, with a draught of 27 feet, touched the ground in a position from which Lamko hill bore  $171^{\circ}$  true, distant 18 miles (*Lat.  $20^{\circ} 13\frac{1}{2}'$  N., Long.  $109^{\circ} 34\frac{1}{2}'$  E.*). This is about 2 miles  $249^{\circ}$  true of the position given for the depth of 4 fathoms mentioned above, and considering the difficulty of fixing the position, it may be a portion of the same bank, as no soundings have been taken between these positions. Shoal water appeared to extend still further to the southward.

A bank of sand half a mile in extent, with a least depth of  $3\frac{1}{4}$  fathoms lies with Cape Kami bearing  $111^{\circ}$  true, distant  $12\frac{1}{4}$  miles. Depths of 6 to 7 fathoms will be found a short distance from it.

A narrow ridge of sand one mile in length, with a least depth of  $4\frac{1}{4}$  fathoms, lies with Cape Kami bearing  $97^{\circ}$  true, distant  $6\frac{1}{4}$  miles.

**Eastern approach.**—The dangerous sandbanks in the eastern approach, upon which the sea usually (but not always) breaks during the north-east monsoon, or with easterly swell, have deep-water channels between them, but extreme caution is necessary in using these passages, as the tidal streams are uncertain, and the shoals in most cases far from land. These channels should not be used at night, or in thick weather.

The following is a general description of the different banks:—

North-east and North banks separate North channel from Middle channel; Seal bank forms the west side of North channel.

**North-east bank**, with 4 fathoms water, is the north extreme of the 10-fathoms contour encircling North bank. It is one mile in length north and south, and half a mile in breadth.

**North bank**, within the 5-fathoms contour, and including outlying patches, is about 10 miles in length in a north-east and opposite direction; near the centre of the bank is a shoal 4 miles in length, with less than 2 fathoms water; and there is a rock with 3 feet water close to its western extreme, with Hainan bluff bearing  $225^{\circ}$  true, distant nearly 15 miles, in lat.  $20^{\circ} 20'$  N., long.  $110^{\circ} 51\frac{1}{2}'$  E. There are several places on North bank with depths of one to 2 fathoms.

**Seal bank**, north-west of North bank, is within the 5-fathoms contour line, 5 miles in length in an east and west direction, 3 miles in breadth at its western end, and half a mile at its eastern. The least water upon the bank is 2 fathoms, with Hainan bluff bearing  $203^{\circ}$  true, distant  $14\frac{1}{2}$  miles.

Shoal patches exist at a distance of 5 miles northward of Seal bank, with depths of 3 feet to 3 fathoms. Westward of them are the shoals which extend north-eastward of Sheldrake sand cay.

*General charts 2062, 2661a.*

*Chart 876, Hainan strait. Var. 0° 50' E.*

**West bank** lies nearly midway between Seal bank and Hainan head. It is about 5 miles in length east and west, and  $1\frac{1}{2}$  miles in breadth towards its west end, with several patches of 3 feet. From the central shallow portion, Hainan bluff bears  $183^\circ$  true, distant  $7\frac{1}{2}$  miles. Little bank, between West bank and the bluff, has been mentioned with Inner passage.

**South banks**, two groups, lie between the Middle and South channels; the northernmost bank, with 2 fathoms least water, is 8 miles in length in an east and west direction, and two-thirds of a mile in breadth within the 5-fathoms contour. Its western 2-fathoms patch lies with Hainan bluff bearing  $251^\circ$  true, about  $7\frac{1}{2}$  miles.

The southernmost bank is about 13 miles in length east and west, with a breadth varying from a half to 2 miles, and depths of 2 feet to 3 fathoms. Near its eastern extreme is a patch of  $2\frac{1}{2}$  fathoms, with Mofu hill bearing  $189^\circ$  true, distant about  $13\frac{1}{2}$  miles. Its western portion is the Hainan head bank, described on page 344, with Inner passage.

**DIRECTIONS.—Aspect.—Landmarks.**—The following objects will be found useful in fixing the position when passing through Hainan strait from the westward, namely, Lamko hill, Lamko point lighthouse, the Hummocks, Kiung chau pagoda, Pochin hill pagoda, Hainan head and Mofu hill on the south side; whilst on the north side are Cape Kami lighthouse, the Shenwen range, and the conical mound at Hai an bay; *see also* landmarks, when approaching the western entrance, on page 335.

In the eastern approach the Taya islands are invaluable.

**Entering Hainan strait from the westward**, the best channel is that between the westernmost bank, which has a least depth of 3 fathoms, and the coast of Hainan, giving a berth of about 4 miles to the island. If bound to Hoi hau, the treaty port of Kiung chau, directions for entering will be found on page 339. The lights on Lamko point, Cape Kami, and at Hoi hau render the navigation fairly safe at night as far eastward as the latter place.

**Proceeding eastward** from Hainan strait there is no great difficulty in taking either the North or Middle channels, or the South channel (through Inner passage), the vessel's departure having been carefully taken from off Hainan head, and course shaped accordingly, but the Middle channel, being much the widest, is preferable. The directions for Middle and also South channels, given on following pages, reversed, will suffice to take a vessel safely through.

The pagoda on Pochin hill bearing  $220^\circ$  true, astern, leads out through North channel to sea, but it must be visible 20 miles or more to ensure passing westward of North bank.

*General charts 2062, 2661a.*

*Chart 876, Hainan strait. Var.  $0^{\circ} 40'$  E.*

For the Inshore passage northward, to Nau chau, *see* pages 347, 348.

Low-powered steam vessels bound from Hainan strait to Hong Kong, finding the north-east monsoon strong, may, on clearing the banks, shape course under fore-and-aft sails for Tien pak, on nearing which, the wind and sea usually moderate. They should then pass northward of Round island by day, or outside Mandarin's Cap by night, and close past Waikaup island, when they can haul up for Great Ladrone island. Fine weather will generally be experienced between Nau chau and St. John islands.

**Entering Hainan strait from the eastward** the Middle channel is preferable in clear weather; in hazy weather South channel (Inner passage), which is buoyed and near the land, should be taken.

The banks do not always break, and the depths, being irregular, give but little warning of approach.

**North channel**, for which there are no marks, is not recommended.

**Middle channel** is the widest, deepest, shortest, and therefore the best approach to Hainan strait from the north-eastward in clear weather. The North Taya island, 648 feet in height, will be seen from a distance of about 30 miles, and should be approached from the northward when bearing about  $209^{\circ}$  true. Mofu hill will be visible shortly after Taya is sighted, being about the same height, and cross bearings of these two objects will, when the vessel is abreast the entrance to Middle channel, be broad enough to give a good position of the vessel. The course through the fairway is about  $265^{\circ}$  true, which course also leads between West bank and Little bank, situated northward of Hainan head; thence keep in mid-channel unless bound to Hoi hau.

Vessels proceeding to Pak hoi should round Cape Kami at a distance of 3 to 4 miles, avoiding the banks with  $4\frac{3}{4}$  and  $3\frac{1}{4}$  fathoms westward of Tong Chong bay; then haul up for Chai une island, sighting it, and thence passing westward of Guie chau island before steering for Pak hoi.

Those bound to Haifong, should keep the south shore of the strait until abreast Hau Sui bay, then steer for Bacht long VI. (Nightin-gale island), and from thence to the Norway islands lighthouse. Easterly or westerly currents of considerable strength may be experienced on this track, but very little north or south set need be feared, unless the monsoon is very strong.

The lights at Cape Kami, Lamko point, and Hoi hau will be of great service to vessels navigating the western part of the strait at night, as before remarked.

*General charts 2062, 2661a.*

*Inset on chart 876; also that chart. Var. about 0° 40' E.*

**South channel and Inner passage** trends close to the north-east coast of Hainan island, and is recommended in hazy weather. The Taya islands should be sighted, whence course may be shaped for Mofu hill, the north-east extreme of Hainan.

A vessel will be in the fairway when North Taya bears 108° true, and Mofu hill 215° true, distant  $8\frac{1}{2}$  miles; from whence a 268° true course should be steered with Pochin pagoda right ahead, until Hainan point bears 302° true, which being steered for leads in between the 2-fathoms patch at the south extreme of Hainan head bank to the northward and the Riversdale patch of  $2\frac{1}{2}$  fathoms, marked by a black buoy with triangle, to the southward. It would be advisable to have the point a little northward of the bearing given when abreast the 2-fathoms patch, more especially as the bank is apparently extending; and a little westward when near the Riversdale, to give each of them a wider berth.

When Hainan bluff (which apparently shows over the land within the point) bears 280° true, or the 180-foot summit of the head 268° true, the vessel will be northward of Riversdale, and should steer about 325° true for the black buoy with ball topmark, on Hainan point spit, passing close westward of the red buoy, with inverted cone topmark; from abreast this red buoy haul more to the northward to pass eastward and northward of the black buoy, to avoid the spit, from whence course may be shaped to the westward, passing northward of Baksha banks.

In the Inner passage, caution is necessary on the flood or north-westerly stream, which sets strongly towards Hainan point reef, and when westward of Hainan bluff the indraught into Pochin bay must be allowed for.

The tidal stream also sets very strong, 4 to 5 knots at times, across this western entrance to Inner passage, rendering it advisable at times to go eastward and northward of Little bank; a danger angle of 40° between Hainan bluff and Pochin pagoda will carry the vessel round the bank well southward of West bank, whence course may be shaped westward through the fairway as from Middle channel.

**Tidal streams.**—In North channel the flood sets S.W. by W. from one to 3 knots an hour, and the ebb N.E. by E. from one to  $3\frac{1}{2}$  knots.

In Middle channel, at the position charted (12 miles 66° true of Hainan point), the flood sets N.N.W. from  $1\frac{1}{2}$  to 3 knots, and the ebb N.E. by E. one to 3 knots. (This is probably for only a portion of the time of flood and ebb.)

In Inner passage the flood sets N.N.W. from one to 3 knots, and the ebb S.S.E. from  $1\frac{1}{2}$  to 3 knots, but at Hainan point the tide is

*General charts 2062, 2661a.*

*Inset on chart 876; also that chart.*

very strong, 4 to 5 knots at springs, as above mentioned, and irregular.

Southward of Little bank the flood sets to the South-west at the rate of 3 knots towards Pochin lagoon.

A full knowledge of the set of the stream in the western approach to Hainan strait, with the rise and fall of the tide, has not yet been arrived at. In every 24 hours the set is easterly for about 8 hours, and westerly for about 16 hours throughout the year, at the rate of one to  $2\frac{1}{4}$  knots, and off Cape Kami as much as 3 knots.

On full and change days in summer the Easterly set commences at 3 p.m.

“	“	“	“	Westerly	“	11 p.m.
“	“	“	winter	Easterly	“	3 a.m.
“	“	“	“	Westerly	“	11 a.m.

and occurs about one hour later every day.

A table has been compiled from observations by Captain de Longueville, of H.I.C.M. gunboat *Tsing Po*, which gives the time of the change of set of the tide in Hainan strait for every day in the year.

This table holds good from the eastern banks in Hainan strait to Bacht Long vi. or Nightingale island in the Gulf of Siam. It was found correct by H.M. Surveying Vessel *Maggie* whilst surveying the Strait during the summer and autumn of 1881. See pages 354, 355.

When the stream is running to the westward a wide berth must be given to Cape Kami, as in that vicinity there is considerable northing in the set.

**Overfalls.**—Heavy overfalls or tide-rips exist all over Hainan strait, but especially in the western approach to Inner passage, that is, between Hainan point and Little bank, and to the northward of Little bank.

There are also patches of discoloured water, which usually consist of vegetable matter from the several rivers, and which have the appearance of shoals, which a cast of the lead will clear up if passing through any of them.

*General charts 2062, 2661a.*



*Chart 876, Hainan strait.*

TABLE SHOWING THE TIME OF THE COMMENCEMENT OF THE EASTERLY

Moon's Age	January		February		March		April		May		June	
	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST
1	3 a.m.	11 a.m.	3 a.m.	11 a.m.	SLACK.		2 p.m.	10 p.m.	3 p.m.	11 p.m.	3 p.m.	11 p.m.
2	4 "	Noon	4 "	Noon	SLACK.		3 "	11 "	4 "	Midnight	4 "	Midnight
3	5 "	1 p.m.	5 "	1 p.m.	SLACK.		4 "	Midnight	5 "	1 a.m.	5 "	1 a.m.
4	6 "	2 "	6 "	2 "	4 p.m.	Midnight	5 "	1 a.m.	6 "	2 "	6 "	2 "
5	7 "	3 "	SLACK.		5 "	1 a.m.	6 "	2 "	7 "	3 "	7 "	3 "
6	8 "	4 "	SLACK.		6 "	2 "	7 "	3 "	8 "	4 "	8 "	4 "
7	SLACK.		6 p.m.	2 a.m.	7 "	3 "	8 "	4 "	9 "	5 "	9 "	5 "
8	SLACK.		7 "	3 "	8 "	4 "	9 "	5 "	10 "	6 "	SLACK.	
9	8 p.m.	5 a.m.	8 "	4 "	9 "	5 "	10 "	6 "	11 "	7 "	SLACK.	
10	9 "	6 "	9 "	5 "	10 "	6 "	11 "	7 "	Midnight	8 "	SLACK.	
11	10 "	7 "	10 "	6 "	11 "	7 "	Midnight	8 "	SLACK.		9 a.m.	6 p.m.
12	11 "	8 "	11 "	7 "	Midnight	8 "	1 a.m.	9 "	SLACK.		11 "	7 "
13	Midnight	8 "	Midnight	8 "	1 a.m.	9 "	SLACK.		Noon	8 p.m.	Noon	8 "
14	1 a.m.	9 "	1 a.m.	9 "	2 "	10 "	SLACK.		1 p.m.	9 "	1 p.m.	9 "
15	2 "	10 "	2 "	10 "	SLACK.		1 p.m.	9½ p.m.	2 "	10 "	2 "	10 "
16	3 "	11 "	3 "	11 "	SLACK.		3 "	11 "	3 "	11 "	3 "	11 "
17	4 "	Noon	4 "	Noon	SLACK.		4 "	Midnight	4 "	Midnight	4 "	Midnight
18	5 "	1 p.m.	SLACK.		3 p.m.	11 p.m.	5 "	1 a.m.	5 "	1 a.m.	5 "	1 a.m.
19	6 "	2 "	SLACK.		4 "	Midnight	6 "	2 "	6 "	2 "	6 "	2 "
20	SLACK.		SLACK.		5 "	1 a.m.	7 "	3 "	7 "	3 "	7 "	3 "
21	SLACK.		5 p.m.	1 a.m.	6 "	2 "	8 "	4 "	8 "	4 "	8 "	4 "
22	SLACK.		6 "	2 "	7 "	3 "	9 "	5 "	9 "	5 "	SLACK.	
23	7 p.m.	3 a.m.	7 "	3 "	8 "	4 "	10 "	6 "	10 "	6 "	SLACK.	
24	8 "	4 "	8 "	4 "	9 "	5 "	11 "	7 "	11 "	7 "	SLACK.	
25	9 "	5 "	9 "	5 "	10 "	6 "	Midnight	8 "	SLACK.		9 a.m.	5 p.m.
26	10 "	6 "	10 "	6 "	11 "	7 "	SLACK.		SLACK.		10 "	6 "
27	11 "	7 "	11 "	7 "	Midnight	8 "	SLACK.		11 a.m.	7 p.m.	11 "	7 "
28	Midnight	8 "	Midnight	8 "	SLACK.		SLACK.		Noon	8 "	Noon	8 "
29	1 a.m.	9 "	1 a.m.	9 "	SLACK.		1 p.m.	9 a.m.	1 p.m.	9 "	1 p.m.	9 "
30	2 "	10 "	2 "	10 "	SLACK.		2 "	10 "	2 "	10 "	2 "	10 "

NOTE.—THE TIME OF HIGH WATER AT FULL AND

\* Compiled, from observations extending over several years, by

## EAST AND WESTERLY SET OF THE TIDAL STREAM IN HAINAN STRAIT.\*

July		August		September		October		November		December		Moon's Age
EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	EAST	WEST	
3p.m.	11 p.m.	3p.m.	11 p.m.	SLACK.		2 a.m.	10 a.m.	3 a.m.	11 a.m.	3 a.m.	11 a.m.	1
4 "	Midnight	4 "	Midnight	SLACK.		3 "	11 "	4 "	Noon	4 "	Noon	2
5 "	1 a.m.	5 "	1 a.m.	SLACK.		4 "	Noon	5 "	1 p.m.	5 "	1 p.m.	3
6 "	2 "	SLACK.		3½ a.m.	Noon	5 "	1 p.m.	6 "	2 "	6 "	2 "	4
7 "	3 "	SLACK.		5 "	1 p.m.	6 "	2 "	7 "	3 "	7 "	3 "	5
8 "	4 "	SLACK.		6 "	2 "	7 "	3 "	8 "	4 "	8 "	4 "	6
SLACK.		6 a.m.	2 p.m.	7 "	3 "	8 "	4 "	9 "	5 "	9 "	5 "	7
SLACK.		7 "	3 "	8 "	4 "	9 "	5 "	10 "	6 "	SLACK.		8
8 a.m.	4 p.m.	8 "	4 "	9 "	5 "	10 "	6 "	11 "	7 "	SLACK.		9
9 "	5 "	9 "	5 "	10 "	6 "	11 "	7 "	SLACK.		SLACK.		10
10 "	6 "	10 "	6 "	11 "	7 "	Noon	8 "	SLACK.		10 p.m.	6 a.m.	11
11 "	7 "	11 "	7 "	Noon	8 "	SLACK.		SLACK.		11 "	7 "	12
Noon	8 "	Noon	8 "	1 p.m.	9 "	SLACK.		Midnight	8 a.m.	Midnight	8 "	13
1p.m.	9 "	1p.m.	9 "	2 "	10 "	SLACK.		1 a.m.	9 "	1 a.m.	9 "	14
2 "	10 "	2 "	10 "	SLACK.		1 a.m.	9 a.m.	2 "	10 "	2 "	10 "	15
3 "	11 "	3 "	11 "	SLACK.		2 "	10 "	3 "	11 "	3 "	11 "	16
4 "	Midnight	4 "	Midnight	SLACK.		3 "	11 "	4 "	Noon	4 "	Noon	17
5 "	1 a.m.	SLACK.		3 a.m.	11 a.m.	4 "	Noon	5 "	1 p.m.	5 "	1 p.m.	18
6 "	2 "	SLACK.		4 "	Noon	5 "	1 p.m.	6 "	2 "	6 "	2 "	19
SLACK.		SLACK.		5 "	1 p.m.	6 "	2 "	7 "	3 "	7 "	3 "	20
SLACK.		5 a.m.	1 p.m.	6 "	2 "	7 "	3 "	8 "	4 "	8 "	4 "	21
SLACK.		6 "	2 "	7 "	3 "	8 "	4 "	9 "	5 "	SLACK.		22
7 a.m.	3 p.m.	7 "	3 "	8 "	4 "	9 "	5 "	10 "	6 "	SLACK.		23
8 "	4 "	8 "	4 "	9 "	5 "	10 "	6 "	SLACK.		SLACK.		24
9 "	5 "	9 "	5 "	10 "	6 "	11 "	7 "	SLACK.		9 p.m.	5 a.m.	25
10 "	6 "	10 "	6 "	11 "	7 "	SLACK.		SLACK.		10 "	6 "	26
11 "	7 "	11 "	7 "	Noon	8 "	SLACK.		11 p.m.	7 a.m.	11 "	7 "	27
Noon	8 "	Noon	8 "	SLACK.		SLACK.		Midnight	8 "	Midnight	8 "	28
1p.m.	9 "	1p.m.	9 "	SLACK.		1 a.m.	9 a.m.	1 a.m.	9 "	1 a.m.	9 "	29
2 "	10 "	2 "	10 "	SLACK.		2 "	10 "	2 "	10 "	2 "	10 "	30

CHANGE MUST NOT BE TAKEN FROM THIS TABLE

Captain de Longueville, of H.I.C.M. Gunboat "Tsing-Po," 1876.

## CHAPTER VIII.

SOUTH-EAST COAST OF CHINA—HAINAN STRAIT TO CANTON  
RIVER, INCLUDING WEST RIVER.

*Chart 2062, Tong King gulf.*

**LEI CHAU PENINSULA.—East coast.**—The east coast of the peninsula, with the Inshore channel along it from Hainan strait, as far northward as Malu hau, from which that channel takes its name, is described in the last chapter, pages 347, 348.

Northward of Malu hau the coast has not been surveyed; it takes a general north-north-west trend to Bécassines point, a distance of about 18 miles, fronted by reefs to the distance of 6 miles or more.

From Bécassines point the coast turns westward and thence northward, forming an extensive but shallow bight, into which a river discharges. The western portion of Tan hai island occupies a large portion of the bight, its west extreme, Sata hopeng, being less than a mile from the peninsula, abreast Tuman fort.

Nearly the whole space between Bécassines point and the southern coast of Tan hai island is blocked by shallow flats, but there is a narrow channel through them, apparently with 4 fathoms water, up to and above the point, whence it becomes very shallow, about 3 feet, again deepening off the south extreme of the island to 4 to 8 fathoms, from whence there is a tortuous channel to Kwang chau wan, with probably a depth of one fathom at low water. This is written from the chart, which is on a very small scale, and of little value.

**Lei chau.—Depths.**—Lei chau, the principal town in the peninsula, is charted about 4 miles within the head of the bight above described, in about lat.  $20^{\circ} 54' N.$ , long.  $110^{\circ} 5' E.$  The river before mentioned flows past it on its southern side, and is navigable by vessels of about 10 feet draught; high water should be taken for crossing the banks in the approach. The chart shows about  $1\frac{1}{2}$  fathoms water in the entrance. Its exports consist of oil, bean cake, and matting for sails.

**Telegraph.**—Lei chau is connected with the telegraph system; a French Catholic mission is established here.

*General charts 2062, 2661a.*

*Chart 3349, Approach to Kwang chau wan. Var. 0° 45' E.*

**NAU CHAU ISLAND.—General remarks.—Depths.**

—Nau chau island, and Tan hai island, within it, occupy a considerable portion of the bight between Gopai point on the north side of Hainan strait and the fort on a point about 46 miles north of it; the remainder of the bight is almost filled with banks with narrow channels between.

The channel southward of the islands is Surprise pass, and leads to Nau chau anchorage from seaward in not less than 4 fathoms at low water; it is buoyed.

Above Nau chau anchorage it has not been properly charted, but it leads to Lei chau, and also by a channel between Tan hai island and the coast of the peninsula to Kwang chau wan, before mentioned, page 356.

The channel northward of Nau chau and Tan hai islands is the direct approach to the Kwang chau wan, described on pages 360-369.

Nau chau island is about 5 miles in length, and on its summit, 279 feet in height, situated on the eastern side, is the lighthouse. The north end of the island is composed of sandhills, from 40 to 50 feet high; the shore is fronted by rocky ledges extending to the distance of half a mile in places.

The island is well cultivated, and is separated from the island within it, Tan hai, by North-west, or Nau chau, channel. The channel along the east side of Nau chau is the Bengali pass. The island is fringed with reef, with outlying dangers, the most important of which will be described.

When seen from the offing, Nau chau appears as a flattened cone, distinguished by its white stone lighthouse, which affords a good landmark for vessels approaching it. Nau chau and Tan hai islands are leased to the French, *see* page 362.

**LIGHT** (*Lat. 20° 54' N., Long. 110° 35' E.*).—On the summit of the island, from a cylindrical stone tower, 63 feet high, a *flashing white* light is exhibited every *five seconds*, at an elevation of 338 feet above high water, visible in clear weather from a distance of 25 miles. *Duration of flash, three-tenths of a second.* The light is sometimes hidden by fog between 150 and 350 feet above the sea, whilst below it the atmosphere is clear.

**Beacons.**—At the northern end of the island there are two towers, 7 cables apart, used as front marks for crossing the bar of the approach to the Kwang chau wan, as described on page 359. There are white leading marks on the south side of the island, as charted.

**SURPRISE PASS.—Dangers.**—From the south-eastern end of Nau chau island foul ground, consisting of numerous sand-

*General charts 2062, 2661a.*

*Chart 3349, Approach to Kwang chau wan. Var. 0° 54' E.*

banks, with deep-water channels between them in places, extends to a distance of from  $3\frac{1}{2}$  to 5 miles in a southerly, south-easterly, and easterly direction, within which area lies the Grand Plateau and many other isolated rocky ledges, some of which show at or before low water. The southernmost of these form the north-east side of Surprise pass.

**Spit.**—Between the south-west extreme of Nau chau and Tamsui, northward of it, a sandy spit, with less than one fathom water, extends  $1\frac{1}{2}$  miles from the shore, and within a depth of 3 fathoms to  $1\frac{8}{10}$  miles off-shore, forming the east side of the South-west anchorage.

**Timosa bank**, about 8 miles in length, tapers to a point at its south-east extreme, which forms the west side of entrance to Surprise pass; it is almost dry in places, and has an average depth of one to 2 fathoms, but it has not been completely surveyed.

**Liu chan sah bank** lies about  $2\frac{1}{2}$  miles southward of the east extreme of Timosa bank; the chart shows depths of  $1\frac{3}{4}$  to 3 fathoms. It has only been imperfectly examined, and breaks in heavy weather. It lies out of the recommended track.

**Buoyage.**—Surprise pass is marked by three red conical buoys on the northern or island side, placed as follows: The outer buoy, in about  $4\frac{1}{2}$  fathoms, lies one mile  $265^\circ$  true of the southernmost shoal patch ( $2\frac{1}{2}$  fathoms), with Si wei loi, a white house on the south side of the island bearing  $338^\circ$  true, distant  $4\frac{1}{2}$  miles. The second red buoy lies westward of a 3-fathoms patch, in about 4 fathoms, about  $1\frac{1}{2}$  miles  $308^\circ$  true from the outer buoy. The third buoy lies, in about  $4\frac{1}{2}$  fathoms, at about 4 cables westward of the 3 fathoms point of the spit extending from the west side of the island; it also marks the south side of approach to North-west channel.

*Charts 2062, 3349.*

**Directions.**—These directions are written from the chart, and therefore must be used with caution. (The Inshore channel from Hainan strait has been described, pages 347, 348.)

Coming from Hainan strait, and having given a wide berth to the banks on its north-east side, Nau chau island may be steered for. With the lighthouse on the summit of the island in sight, it may be approached on a  $316^\circ$  true bearing until Mount Kamlung, 900 feet in height, on Lei chau peninsula, bears  $271^\circ$  true (supposing it to be correctly charted), from which position a course  $296^\circ$  true, allowing for tide, will lead to the outer red buoy. (*Chart 3349.*) Pass about three-quarters of a mile south of it, and about the same or less distance westward of the second red buoy, in not less than 4 fathoms. The chart 3349 gives a line for crossing the bar here,

*General charts 2062, 2661a.*

*Charts 2062, 3349. Var.  $0^{\circ} 45'$  E.*

namely, a white cone on the south side of Nau chau in line with a white house near the shore, bearing  $1^{\circ}$  true, with a fairway depth of about  $3\frac{1}{2}$  to 4 fathoms. When about a mile northward of the buoy, or  $2\frac{1}{2}$  miles from the white house mentioned, a course about  $305^{\circ}$  true will lead to South-west anchorage, about three-quarters of a mile southward of the red buoy there.

**Tides.**—It is high water, full and change, at Fort Boutet point, south entrance to North-west channel, at 10h. 20m.; springs rise  $12\frac{3}{4}$  feet, neaps 8 feet.

In the channel the stream runs  $2\frac{1}{2}$  knots at springs, changing about one hour after high and low water, the flood setting to the southward, and the ebb to the northward. Off Tam sui, outside the south entrance, the flood stream from the northward through the channel meets the flood stream coming from the south-eastward through Surprise pass; the streams separate at the same spot.

*Chart 3349.*

**Anchorage.—South-west.**—There are depths of 5 to 9 fathoms in South-west anchorage south-west of the red buoy, and on the line of the lighthouse with the mark on the shore, which is the mark for approaching the entrance of North-west channel. See the Port anchorage, page 360.

**North anchorage.**—There is anchorage off the north end of the island in the south-west monsoon period in 6 to 7 fathoms, off the black and white leading mark towers, eastward of the north entrance to North-west channel of Nau chau.

**Beacons.**—Abreast this anchorage, on the north part of Nau chau, are two beacons, used as front leading marks for Kwang chau bar. The eastern one is a tower, 23 feet in height, painted in black and white bands; it is known as North-north-east beacon, and is in line with Nau chau lighthouse when bearing  $181^{\circ}$  true. The other, known as North-north-west beacon, is a cone-shaped structure painted white, with one horizontal black band.

There are no dangers in the approach from seaward to the North anchorage; Jacquelin hill, on Tan hai, bearing  $294^{\circ}$  true, leads in.

Vessels of moderate draught can proceed at high water through North-west channel to Nau chau port and the South-west anchorage off Tam sui, through North-west channel, below mentioned.

**THE PORT.—North-west channel** separates Nau chau from Tan hai island. The southern entrance is a quarter of a mile wide between Fort Boutet and Horse-shoe bank, and it is about the same breadth throughout, between Middle bank, which nearly dries in places, and North-west bank. Both entrances are barred, with a

*General charts 2062, 2661a.*

*Chart 3349, Approach to Kwang chau wan. Var. 0° 45' E.*

low-water depth of  $3\frac{1}{4}$  fathoms in the northern and  $2\frac{3}{4}$  to 3 fathoms in the southern.

Shallow water (not surveyed) extends about 3 miles off the eastern side of Tan hai island, west side of north approach to North-west channel, referred to on page 361.

**Buoys.**—The channel is marked by red buoys on its eastern side, apparently, but a black buoy, resembling a mooring buoy, is charted on the eastern side, off the extreme of a sunken ridge of rock. It is not advisable in other than small craft to enter this channel without local knowledge.

**Bouquet point.**—**Horse-shoe bank**, which nearly dries at its eastern extreme, is situated on the shallow flat which surrounds Bouquet or Clump point, the west point of south entrance to North-west channel; the point is low and sandy, with a clump of trees within it.

**Fort Boutet.**—The east point of the south entrance ends abruptly in a high clump of trees, at the extreme of which Fort Boutet, in ruins, is just visible; the point is steep-to.

**Anchorage.**—There is well-sheltered anchorage in North-west channel, which is the Port of Nau chau, in from 5 to 10 fathoms, mud and sand, at about three-quarters of a mile within Fort Boutet, approached over the bar, with from  $2\frac{3}{4}$  to 3 fathoms water, before mentioned.

**Nau chau.**—The town of Nau chau is situated on the western side of the island, off which there is good anchorage, used as a port of call by the junks trading to Tong King gulf. It is governed by a Civil Mandarin. The town is not shown on the plan, but it is apparently north-eastward of Fort Boutet, in North-west channel, referred to as the port.

**Tam sui** is charted on the shore southward of Fort Boutet; Fort Portier, a military post, lies just within it. The village of A mio lies northward of Tam sui, and A kong southward of it, with a new fort and pagoda.

**KWANG CHAU WAN APPROACH.**—The approach to this bay is between the north side of Nau chau island and the dangers extending about 7 miles south-eastward of the south extreme of Aigrettes island, which island forms the north side of Le Goulet, the entrance to the bay, one mile wide; the Goulet lies between Aigrettes island and the north extreme of Tan hai island, and it is about  $1\frac{1}{4}$  miles

*General charts 2062, 2661a.*

*Chart 3349, Approach to Kwang chau wan. Var.  $0^{\circ} 45' E$ .*

wide, with depths of 10 to 20 fathoms, and from 7 to 15 fathoms in the bay within it.

**Aspect.—Beacons.**—Jacquelin hill, 364 feet in height, on Tan hai island, south side of the approach, is probably the first object seen from the offing, from which it would be visible about 25 miles in clear weather; a series of sand dunes extend from it to the coast, where there is a black leading beacon.

The south point of the entrance is low, sandy, and rounded; within it is a sand dune, Red hill, 98 feet in height.

The summit of Nau chau, with its lighthouse, also on the south side of the approach, will appear about the same time. On the north side of the island are two towers, painted black and white, used as leading beacons, page 359.

On the north side of the entrance to Kwang chau wan are several wooded hills, which are prolonged towards the north by high sand dunes. The most remarkable of these, Colline Verte (Green hill) is wooded only on its south and west sides; there is a black and white tower on it, visible as soon as it appears above the horizon, and there is a black and white seamark (wall) between it and the shore.

Morne de Bouquet, westward of it, close to the north side of the entrance, is a wooded hill with a pagoda on it.

**Bar.—Dangers** (*Lat.  $21^{\circ} 0' N$ , Long.  $110^{\circ} 36' E$* ). — The approach is over a bar with a low water depth of  $3\frac{1}{2}$  fathoms over it at low water, eastward of the central patch of  $2\frac{1}{2}$  fathoms, and about  $3\frac{1}{4}$  fathoms westward of that patch, on the separate pairs of leading marks. The western side of the bar is formed by the shallow banks extending about 3 miles eastward of the shore under Jacquelin hill; and the eastern side by the shoals extending south-eastward of Aigrettes island; the west extreme of the outer or southernmost bank (which is about  $1\frac{1}{2}$  miles in length, east and west, within a depth of 3 fathoms) lies with Jacquelin hill bearing  $277^{\circ}$  true, about  $5\frac{1}{2}$  miles.

At  $2\frac{1}{2}$  miles northward of this position are shoals marked by breakers, and which are continuous up to Aigrettes island.

Between the 3-fathoms edge of the bank mentioned and the nearest breakers northward are several patches of  $2\frac{3}{4}$  and 3 fathoms, and one with 6 feet only; the south-westernmost has a depth of  $2\frac{3}{4}$  fathoms, and is  $2\frac{1}{2}$  cables eastward of the eastern track over the bar.

There is a channel between the outer bank and these patches, with  $3\frac{1}{2}$  fathoms water, the mark for which is Jacquelin hill (north end of table top) in line with the black tower on the shore,  $273^{\circ}$  true.

**Buoy.**—A black buoy, with cylindrical topmark, lies in 4 fathoms on the eastern side of the bar channel at one mile  $147^{\circ}$  true of the fairway patch of  $2\frac{1}{2}$  fathoms.

*General chart. 2062.*



*Chart 3486, Kwang chau wan and River Matshé; also 3349.*

The fairway patch, with  $2\frac{1}{2}$  fathoms least water, lies with Jacquelin hill bearing  $276^\circ$  true, distant  $4\frac{1}{10}$  miles.

The chart will afford better information than any written description of the other shoals, the survey of which is incomplete.

*Chart 3486, Kwang chau wan and River Matshé; also 3349.*

**KWANG CHAU WAN.**—General remarks.—The bay and the territory of Kwang chau was leased to France in 1899 for 99 years, and in the same year the two islands in the approach, Nau chau and Tan hai, were included in the arrangement. The whole are under the administration of the Governor-General of Indo-China.

**Depths.**—The bay of Kwang chau is about  $6\frac{1}{2}$  miles in length in an east-south-east and opposite direction, between Le Goulet, its entrance, and Tat chin island, abreast Portalis point (between which is the entrance to Matshé river), by about  $5\frac{1}{2}$  miles in breadth; the navigable portion is reduced to a comparatively narrow channel, but not anywhere less than 3 cables wide between the 5-fathoms contour line, and which is a continuation seaward of the Matshé. Its entrance, Le Goulet, is rather over a mile wide, with depths of 7 to 20 fathoms; within it the fairway depths are irregular, but not less than 7 fathoms at low water on the leading marks.

In the approach, over the bar, the low-water depth is from  $3\frac{1}{4}$  to  $3\frac{1}{2}$  fathoms, respectively, west and east of the fairway patch, with a maximum rise of  $12\frac{3}{4}$  feet, neaps 8 feet, so that the bay is available for nearly all classes of vessels at high water springs.

The bay affords anchorage for all draughts in most of the reaches; at 3 miles above the entrance to Matshé river, and one mile above Fort Bayard and the military station of Hoi Teou, is Hoi Teou road, about 4 cables wide, with depths of 16 fathoms.

The Matshé, above Hoi Teou road, has depths of not less than 5 fathoms up to the north end of Taocien island, but it gradually decreases in width; thence to Matshé (Mapum) town, about  $2\frac{1}{2}$  miles, the depths decrease to 3 fathoms. Thence to Montao (*Lat.  $21^\circ 24' N.$ , Long.  $110^\circ 22' E.$* ),  $3\frac{1}{2}$  miles above, the depths are probably under 7 feet in places at low water springs; see the charts, and also page 366.

Above Montao it is not navigable by large junks.

The shores of the bay are low and sandy, fronted almost everywhere by long banks of soft mud and by shingle, which uncover at low water. There are, however, some reddish cliffs, and numerous clumps of trees which shelter villages.

**Directions.**—See page 367.

*General charts 2062, 2661a.*

*Chart 3486, Kwang chau wan and R. Matshé; also 3349. Var. 0°45'E.*

**South shore of the bay.**—This shore, which is the north coast of Tan hai island, consists at first of a low sandy point, uncovering at low water and forming the northern side of the mouth of a creek; a sand dune, 98 feet in height, is situated within this point, before mentioned with the approach.

To the south-west of the creek, the coast, for a distance of 2 miles, consists of cliffs, much broken up, and about 65 feet in height; along the foreshore are patches of rocks.

The coast is then low and sandy as far as Cylindre point, where it again rises to a low cliff.

**An observation spot,** situated on the cliff, 79 feet high, is marked by a black stone beacon.

**Beacon.**—A leading mark, a white pyramid, is erected on the cliff about 335 yards to the westward of the observatory beacon.

**Lin fa than island** (*Lat. 21° 7' N., Long. 110° 24' E.*), situated about half a mile to the northward of Cylindre point, south side of the bay, is well cultivated. In the centre is a wood in which is a village.

The north and east sides of the island are bordered by banks of rock and mud; from the south-east point a long strip of sand, which uncovers for a distance of nearly 6 cables, extends to the south-eastward.

**Patch.**—A one-fathom patch, steep-to, lies on the 3-fathoms contour bordering the channel, at 6 cables 85° true from the south extreme of the island.

The passage between the island and Cylindre point is encumbered with rocks and mudbanks.

**Beacons.**—On the north coast of Lin fa than island is a white stone pyramid, and within it is another white beacon, consisting of a pyramid of bamboos covered with wicker-work; it is situated 273 yards 179° true from the former.

**Chenal de l'Estoc** lies between Lin fa than island and Lei chau peninsula; it leads to the town of Lei chau, but is only available by small craft with local knowledge. It has been used by gun vessels, but it is full of dangers, rendering it imprudent to use it unless possessing good local knowledge. It has the advantage of being sheltered throughout its length, and of avoiding the bar, on which at times during the north-east monsoon there is a nasty sea; it has been referred to on page 356.

**West shore of the bay.**—Between Fishers rock, west side of L'Estoc channel, and Portalis point, the coast is fronted by a sand-

*General charts 2062, 2661a.*

*Chart 3486, Kwang chau wan and R. Matshé; also 3349. Var. 0°45'E.*  
bank, extending to a distance of one mile from the high-water mark, with patches of rock which dry 6 feet at its extreme, between which and Tat chin island the mouth of the Matshé is only  $2\frac{3}{4}$  cables wide between the 5-fathoms contours.

**Portalis point.—Beacons.**—The right bank of Matshé river terminates at Portalis point, which is a red cliff.

About 1,100 yards to the westward of this point are two white pyramidal beacons, which, when in line, bear  $317^\circ$  true.

**North shore of the bay.—Aigrettes island.**—This shore, which is the south coast of Aigrettes island, lies north-westward of Morne du Bouquet, is low and swampy, and intersected by several waterways used by trading junks. There is a swatchway leading to Port Beaumont, and from thence out to the main stream.

**Beacons.**—On Colline Verte, within the south extreme of Aigrettes island, is a black and white tower, 56 feet high; on the shore westward of it is a black and white pyramid beacon; these in line,  $70^\circ$  true, form a leading mark from the Goulet south-westward into the bay.

There is a black and white mark on a wall half a mile south-eastward of the tower on Colline Verte, before referred to with the aspect of the approach.

At Pyramide point, situated about  $3\frac{1}{4}$  miles north-westward of the Morne, the coast consists of red cliffs.

**Port Beaumont** is situated about 2 miles north-westward of Pyramide point on Beaumont or South Pak hai island. The Port office was formerly here, also huts for about 100 men, and a small workshop containing the necessary tools and material for the maintenance of the buoys in the bay. *See Nivet point, page 365.*

There is a small landing pier, dry at low water, at Port Beaumont.

**Tat chin island**, situated on the south side of Port Beaumont, forms the east side of the entrance to Matshé river; it is well cultivated, and has several villages. Shallow water extends 4 cables northward of Fillette point, its north-west extreme, between which and the flat extending off Beaumont island is a channel with 15 feet water into Port Beaumont.

Tat chin bank, of sand and rocks, which uncovers at spring tides, extends for a distance of  $1\frac{1}{2}$  miles south-eastward of the island, with a rock which dries 11 feet near its extreme.

**Detached shoals** lie outside the 5-fathoms contour of Tat chin bank, on the eastern side of the fairway, as follows: A patch of  $2\frac{1}{2}$  fathoms at 4 cables  $186^\circ$  true of the west extreme of Tat chin island; and a patch with  $1\frac{1}{4}$  fathoms  $174^\circ$  true  $1\frac{4}{10}$  miles from the same point.

*General charts 2062, 2661a.*

*Chart 3486, Kwang chau wan and River Matshé. Var. 0° 45' E.*

**Shoals.—Yuyu bank.—Beacon.**—South-eastward of Tat chin bank are the Yuyu and Middle banks; the latter has several patches which dry from 5 to 8 feet.

On the north-east side of Yuyu bank is a wooden beacon, 20 feet high, surmounted by a circular topmark, a guide, with local knowledge, through Yuyu swatchway. Southward of these banks are other banks, with rocks awash and above water at times, extending a distance of 2 miles, forming the north side of the fairway into the bay.

The south-westernmost patch,  $2\frac{1}{4}$  fathoms, lies  $316^\circ$  true nearly  $1\frac{1}{2}$  miles from Observatory beacon, on the south shore; it is marked by a buoy.

Between these and Morne du Bouquet point, to the eastward, is the southern entrance to the in-shore swatchway for small craft, just referred to.

**Buoys.**—A red conical buoy, with cylindrical topmark, marks the south-western patch of  $2\frac{1}{4}$  fathoms (the Fisheries) at the elbow of the fairway, at  $1\frac{4}{10}$  miles  $316^\circ$  true of the Observatory beacon. A similar buoy marks the west extreme of a spit extending south-westward of Middle bank, close to a one-fathom patch. Nearly midway between these buoys is a third red buoy, marking a  $2\frac{1}{2}$ -fathoms patch.

A red buoy, with cylindrical topmark, lies  $1\frac{1}{2}$  cables north-west of the  $1\frac{1}{2}$ -fathoms patch close east of the fairway,  $1\frac{4}{10}$  miles south of the west extreme of Tat chin island.

**MATSHE RIVER.**—For depths, see Kwang chau wan, page 362. Matshé river is nearly a mile in width at its mouth where it enters the bay between Portalis point and Tat chin island. The navigable channel, within the 5-fathoms contour, is about 3 cables wide, with depths of 14 to 17 fathoms on the island side, which is steep-to, while Portalis point is fronted by a mud-bank, with rocks dry at low water some 6 feet, at its extreme.

**Nivet point**, situated about 2 miles northward of Tat chin island, is steep-to; behind it is a large clump of trees sheltering a village. This is one of the spots proposed for the Port office, referred to with Port Beaumont, page 364.

**Chenal des Aigrettes** lies between Nivet point and North Pak hai island; it is apparently dry at low water within the centre of that island.

**Fort Bayard.**—Opposite Nivet point, on the right bank of the river, is Fort Bayard, the flagstaff of which can be seen as far as the mouth of the river. There is a military post here.

Extending from the flagstaff is a bank of mud, which at spring tides dries for more than half a cable beyond the end of the pier constructed in front of the fort.

There is a mooring buoy off this pier (not on chart).

*General charts 2062, 2661a.*

*Chart 3486, Kwang chau wan and River Matshé. Var. 0° 45' E.*

**Alouette rock** is situated nearly in the middle of the river, about 9 cables 163° true of Fort Bayard flagstaff. It consists of two shoals about a cable apart in the direction of the channel; on the southern one there is a depth of one foot at low water, and on the northern one  $1\frac{1}{2}$  fathoms.

**Buoy.**—A buoy, painted black, with cylindrical topmark, is moored in deep water on the eastern side of these dangers; the fairway is eastward of the buoy, on the leading marks, Northern (Nord) peak in line with Nivet point, 22° true.

**The west bank** of the river, to the northward of Fort Bayard, forms a curve, at the head of which is seen Bonheur tower, an isolated monument easily recognisable. In the background, a chain of heights, on which is situated the military post of Hoi tau, approaches gradually to the river, and terminates at Caravan point, which is on the south side of the approach to Chékam creek.

On the bank, midway between Bonheur tower and Caravan point, are two twin hillocks about 50 feet in height.

**The east bank** of the river, to the northward of Nivet point, for about 2 miles, consists of a low cliff, nearly horizontal, on the summit of which is cultivated ground and numerous clumps of trees, containing villages. Abreast is Hoi Teou road.

Thence northward the deep bight in the coastline is fronted by a mud-flat to the distance of three-quarters of a mile.

On the north shore of this bight is a green isolated hillock, about 40 feet in height, known as the Tumulus. Behind, appears in the distance, Nord peak, an isolated conspicuous mountain, probably that shown on chart 2062 as 460 feet high.

**The channel to Montao.**—To the northward of Caravan point the channel of the river narrows, nevertheless, large vessels can find good anchorage in not less than 5 fathoms off the mouth of the Chékam, in a position about 2 miles northward of Caravan point.

The river is easily navigable for gunboats as far as the passes of Shekmun, a short distance below the Chinese town of Montao. These passes are very narrow, and strewn with rocks. The French gunboat *Comète* ascended them in 1899, and anchored off Montao, but the anchorage there is very narrow, and the current runs strongly.

The survey of the river has not been carried beyond Montao; above this point it ceases to be navigable for large junks.

**ANCHORAGE.**—There is anchorage almost anywhere in Kwang chau bay, and the Matshé river, as before stated. The usual anchorage apparently is in Hoi Teou road (*Lat. 20° 12' N., Long. 110° 25' E.*), in about 10 fathoms.

*General charts 2062, 2661a.*

*Chart 3486, Kwang chau wan and River Matshé. Var. 0° 45' E.*

A submarine cable is laid in the Matshé river, above Fort Bayard, from near Bonheur tower to a position near half a mile above Nivet point, as charted. Its position is indicated by four red beacons with triangles on the shore, two on each side, marking a rectangular space within which anchorage is prohibited.

*Charts 3349, 3486.*

**Tides.**—There is a great diurnal inequality in the tides in Kwang chau wan, a difference of  $4\frac{1}{2}$  feet between two consecutive high waters having been observed; the range of tide is sometimes as much as 18 feet, the least being about 10 feet; the above is a note on the chart. According to the French tide tables for this neighbourhood it is high water, full and change, at about 10h. 30m., with a rise of  $11\frac{1}{2}$  feet, which does not differ much from Nau chau, page 359.

### **DIRECTIONS.—Kwang chau wan and Matshé river.**

—From seaward steer for Jacquelin hill, keeping it between the bearings of about  $271^\circ$  and  $299^\circ$  true. Depending on the direction from which a vessel is approaching, Nau chau lighthouse, on the summit of that island, may be seen before sighting Jacquelin hill. When within about 10 miles of the north end of Nau chau, Jacquelin hill being steered for, bearing  $299^\circ$  true, will lead to the northern anchorage of Nau chau, and to the approach to Kwang chau wan bar.

(If not crossing the bar at once, anchorage can be taken in about 7 fathoms with Jacquelin hill bearing about  $301^\circ$  true, and Nau chau lighthouse in line with the north-north-east black and white tower bearing  $181^\circ$  true.)

To cross the bar; when Nau chau lighthouse bears about  $192^\circ$  true the vessel will be about  $1\frac{1}{2}$  miles south-east of the bar buoy; course should then be gradually altered to the northward to pass westward of the buoy, with Nau chau lighthouse in line with the north-north-east tower (black and white horizontal bands, near the shore) bearing  $181^\circ$  true, keeping these beacons in line, astern, until the east end of the flat top of Jacquelin hill is in line with the black beacon on the shore, bearing  $273^\circ$  true, at which intersection the vessel will be nearly midway between the fairway patch and the  $2\frac{3}{4}$ -fathoms north-east of it, and on the centre of the bar. From this position a course  $345^\circ$  true (allowing for tide) should be steered until the black and white tower on Colline Verte is in line with the black and white mark below it, bearing  $327^\circ$  true, when the vessel will be within the bar, and in deep water.

The leading mark westward of the fairway patch has about  $1\frac{1}{2}$  feet less water, or  $3\frac{1}{4}$  fathoms at low water springs; it has the advantage

*General charts 2062, 2661a.*

*Charts 3349, 3486. Var. 0° 45' E.*

over the eastern track of running straight on a line of beacons across the bar, and immediately on another line of beacons within the bar, whereas on the eastern line a course has to be steered for  $1\frac{1}{2}$  miles without marks. The bar mark is the clump of trees westward of Nau chau lighthouse, in line with the north-north-west beacon, white conical, with one black band, on the north end of Nau chau, astern, bearing  $182^\circ$  true until Colline Verte tower is in line with the mark south-east of it, bearing  $327^\circ$  true, as before.

The above transit line,  $327^\circ$  true, should be followed until Jacquelin hill bears  $257^\circ$  true. From this position, Lon tain, a distant summit, will be seen through the Goulet or entrance, if the weather be clear, between the wooded ridge and the north point of Lin fa than island, bearing  $285^\circ$  true, which course will lead through the Goulet, but there are no dangers in it, and it is only necessary to keep in the fair-way until near the next line of beacons, namely, Colline Verte tower, in line with the black and white pyramid south of Morne du Bouquet point, bearing  $70^\circ$  true, which, kept astern, leads up the first reach until near the red buoy at the south-west extreme of the mass of shoals on the north side of the bay, when Jacquelin hill will be in line with the white pyramid eastward of the Observatory beacon, bearing  $133^\circ$  true, which, kept astern, leads westward of the buoy.

*Chart 3486, Kwang chau wan and River Matshé.*

When the red pagoda on the south side of Lin fa than island bears  $285^\circ$  true, or Colline Verte beacon is in line with the pagoda on Morne du Bouquet point,  $84^\circ$  true, steer  $344^\circ$  true for 6 cables, for the red buoy on the spit, to give a good berth to the 6-feet patch eastward of Lin fa than island, until Cylindre point is touching the south extreme of Lin fa than island, when the white pyramids westward of Portalis point will be in line bearing  $317^\circ$  true, and being steered for will lead up the next reach westward of the red buoy, and westward of the detached patches off Tai chin island, up to, and southward of, the red buoy with triangle topmark, marking them.

(The western end of the summit of Jacquelin hill in line with the Observatory beacon,  $137^\circ$  true, is a better mark for coming out on, as they will be ahead, and the objects are much farther apart.)

Approaching the red buoy with triangular topmark, just mentioned, course should be altered gradually to bring the pyramid beacons on Lin fa than island in line, astern,  $179^\circ$  true, which leads up the channel westward of the buoy, and about a cable westward of the  $2\frac{1}{2}$ -fathoms patch southward of the west extreme of Tat chin island, and where a vessel might be a little westward of the line with advantage.

From abreast Portalis point, the west point of entrance to Matshé river, Nord peak (probably the 460-feet hill shown on chart

*General charts 2062, 2661a.*

*Chart 3486. Var. 0° 45' E.*

2062) in line with Nivet point, bearing 22° true, will lead up eastward of Alouette rocks, marked by a black buoy, from abreast which the fairway should be kept to Nivet point, with Caravan point 2° true, which will ensure a good berth to the rock which dries southward of Fort Bayard pier and on the edge of the 3-fathoms contour. Above Fort Bayard, Tumulus hill, situated north-eastward of Caravan point, on the eastern shore, open to the westward of Nord peak, leads in not less than 23 feet abreast Bonheur tower, on the western side of the river.

There is anchorage off Nivet point, or in Hoi teou road, northward of the telegraph cable, page 366.

**Communication.**—A bi-monthly mail steamer runs between Kwang chau wan and Haifong, calling at Hoi hau and Pak hoi both going and returning.

*Chart 2062, Tong King gulf. Var. 0° 30' E.*

**THE COAST** north-eastward from Kwang chau wan is low and sandy for a distance of 10 miles, at which distance is a fort. Westward of the fort is an estuary fronted by breakers to the distance of 2 or 3 miles, and which has not been surveyed. About 10 miles within the fort is a peaked hill 460 feet in height, the only one in this neighbourhood, and probably the one referred to as the Nord or northern peak in Kwang chau wan.

Thence the coast continues low for 24 miles in a north-easterly direction to An kang shan hill, situated close to the shore. This coast has not been sounded, and therefore should be given a wide berth.

**An kang shan**, at about 5 miles south-west of Sui tung, is a bold hill, 515 feet high, with a steep cliff on its sea face. A sunken rock is charted about half a mile off it, with others extending 4 miles to the westward; unsurveyed ground.

**Sui tung harbour** (*Lat. 21° 28' N., Long. 111° 5' E.*).—The entrance to this harbour is narrow and dangerous; the outer bar, upon which there is a depth of 6 feet at low water, is situated 6 miles eastward of An kang shan hill, and 2 miles 147° true from the entrance to the harbour; the banks in the vicinity of the bar shift during strong winds, and the sea breaks heavily upon them.

The flat coast between the entrance and the An kang shan hill is a peninsula, with two remarkable rocky cones from 30 to 60 feet high.

Within the entrance, a narrow channel between mud banks leads to the village of Sui tung, about 5 miles up.

The capital town of the district is named Um cheun, and is situated 12 miles north-west of Sui tung.

*General charts 2661a, 1263.*



*Chart 2212, Tien pak to Macao. Var. 0° 30' E.*

**Coast.**—About midway between Sui tung and Tien pak is Chun san, a white hummock about 70 feet in height. This coast is fronted by a shallow bank to the distance of 2 to 3 miles.

**TIEN PAK** (*Lat. 21° 30' N., Long. 111° 15' E.*) is the principal place on the south coast of China where salt is produced; several hundred junks are employed in transporting it.

The outer portion of the peninsula forming the eastern side of the harbour is known as the high land of Lamtau; it is connected by an isthmus of sand with the high land within it, and has the appearance of a round mountain in coming from the eastward; its southern extreme is Sie ho point.

**Islets and dangers.**—**Sie ho reef.**—At about one mile off the point eastward of Sie ho point is Sie ho reef, about a mile in extent, with a rock always above water near its centre. There is a depth of 10 fathoms close to its south side, and 7 fathoms between it and the shore.

At half a mile south-west of Sie ho point lies Pauk piah, a large white rock, with 6 fathoms water between, and a rock awash at times westward of it.

Fung ki chau, a small island, lies about  $1\frac{1}{2}$  miles to the westward of Pauk piah; about midway between is a sunken reef.

Ti fung kioh, about 2 miles south-westward of Fung ki chau, is of considerable height, and the outermost island in the approach. A shallow bank extends about  $1\frac{1}{2}$  miles northward of it, with a sunken rock 150 yards off-shore. Marble and Black rocks are situated on the edge of the shallow bank, which extends from  $1\frac{1}{2}$  to 3 miles off-shore westward of the harbour.

**Outer anchorage.**—A small vessel in want of shelter in the north-east monsoon period may anchor in 4 fathoms, sand and mud, westward of Sie ho point, between Pauk piah and the sunken rocks northward of it, in the approach to the harbour.

Larger vessels may anchor in a depth of 6 fathoms within a line joining Fung ki chau, and Ti fung kioh, with shelter from the south-west winds; Fung ki chau and Sie ho point will break the force of the north-east winds.

**Tien pak harbour.**—The entrance to the harbour is about a third of a mile wide between the north-west extreme of Lamtau peninsula and the triangular sandbank extending southward from the western part. The channel to the river is between flats, dry at low water, with depths of 5 to  $2\frac{1}{2}$  fathoms, and 2 fathoms in the river abreast the forts. The approach, apparently, has from 2 to 3 fathoms water, northward of the outer islets, and westward of the sunken rocks extending from the peninsula.

*General charts 2062, 2661a, 1263.*

*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

**Directions.**—A small craft wishing to enter should first anchor near the north side of Pauk piah, to be ready to cross the bar after having examined the channel if a pilot is not obtainable. The best time to enter would be near low water, as the banks on either side are then discernible usually from aloft.

The trading junks enter the river between the forts, where they load salt.

A village is situated on the north bank within the forts.

**The town** of Tien pak is walled round, and is of considerable extent; it stands at the head of the shallow bight eastward of the inlet, and can only be approached in boats at high water, through the creeks that intersect the extensive flat between it and the entrance.

**Supplies** of provisions may be obtained from the villages contiguous to the harbour. Water may be obtained on the island Ti fung kioh, at a small spring near the shore; but the Chinese boats will bring it from the city at a very moderate rate.

**Tides.**—It is high water, full and change, on the bar of Tien pak harbour, at about noon; springs rise  $8\frac{1}{2}$  feet. During the north-east monsoon period there is almost a constant westerly current along this coast, with a velocity of from half to  $1\frac{1}{2}$  miles per hour.

**OFF-LYING ISLANDS.**—**Tai chuk chau** (*Lat. 21° 26' N., Long. 111° 24' E.*) is an island 285 feet in height, situated about 7 miles eastward of Sie ho point, and  $2\frac{3}{4}$  miles from the coast. There is anchorage within half a mile of, or farther off, its west side, in a depth of 4 to 6 fathoms, fine sand, with shelter from easterly winds. A reef of rocks lies between the island and the shore, with a depth of 4 to 5 fathoms inshore of it.

**Chin chau**, situated about 5 miles eastward of Tai chuk chau, and one mile off-shore, is 415 feet high, and covered with grass and bush.

**A reef**, with a rock awash, on which the sea generally breaks, extends about a mile southward of it, and a rock, with a depth of 4 feet, lies 321° true, distant about  $1\frac{1}{2}$  miles from the island.

Near the east side of the island there is a depth of 8 fathoms, foul ground; to the westward, between it and Tai chuk chau, there are depths of 7 to 8 fathoms, gravel.

**Gui tong.**—Rocks from 20 to 50 feet high lie inshore of Chin chau, within which is a shallow bay, having on the east side a fort and an inlet available for boats, named Gui tong, or Fish pass.

**Song yui point**, about 10 miles eastward of Chin chau, is a low sandy point forming the south-west extremity of the bay, at

*General charts 2062, 2661a, 1263.*

*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

the north-east part of which is Hui ling san harbour. Some islets or rocks lie off the point with sunken rocks just beyond, near which there are depths of 8 to 10 fathoms. About 2 miles within it is the south-west extreme of the Rugged mountains, which back the coast as far as the entrance to Hui ling san harbour.

The bay on the west side of Song yui point is shallow, and Song yui town is situated at its head.

**The Brothers**, situated 2 to 3 miles north-eastward of Song yui point, are two islets about three-quarters of a mile off-shore, having sunken rocks projecting from them to the distance of from half to one mile.

**HUI LING SAN ISLAND** is  $12\frac{1}{2}$  miles in length, east and west, from about 2 to 4 miles in breadth, and 1,350 feet in height near its centre; the Sugar Loaf, appearing of that shape when seen from the westward of Bluff point; it is separated from the coast by a narrow passage not surveyed; the harbour of the same name is on its south-west side.

Two islets, named Mame chau, lie close to the south-west point of the island connected to it and with Deep-water point to the northward by a sand-flat. At about a mile north-eastward of Deep-water point is a hill covered with trees, with the small fort of Hui ling Potoi on its summit, nearly hidden.

Bluff point, 3 miles eastward of the islets, is high, with a depth of 9 to 10 fathoms water near it.

At 4 miles eastward of Bluff point, and abreast the Sugar Loaf hill, are three rocky islets about half a mile off-shore, with a reef, steep-to, extending a short distance beyond.

At three-quarters of a mile southward of the east point of Hui ling san, there is a reef of rocks nearly covered at high water, with 6 fathoms close-to. Off the east point is an islet. On the east part of Hui ling san there is a patch of red sand, discernible when off the Mandarin's Cap, to the south-eastward.

*Plan of Hui ling san harbour on 2212.*

**HUI LING SAN HARBOUR** (Lat.  $21^{\circ} 35' N.$ , Long.  $111^{\circ} 47' E.$ ), open to the south-westward, is situated close to the south-west extreme of the island of the same name; it affords good shelter to one or two vessels of moderate draught in a depth of 4 to 6 fathoms, in the north-east monsoon period, with plenty of room and shelter for small craft at all times.

The harbour is  $1\frac{1}{2}$  miles wide in the entrance between the Mame chau islets and the reef which breaks off the western shore, but the deep water, 5 fathoms and above, lies close towards the islets, and is

*General charts 2062, 2661a, 1263.*

*Plan of Hui ling san harbour on 2212. Var. 0° 25' E.*

but a quarter of a mile wide; a depth of 4 fathoms will be carried up as far as the fort at Hui ling Potoi, above which the depths rapidly decrease.

**Shoals.**—A shoal about 3 cables in length, with from  $2\frac{1}{4}$  to 3 fathoms, lies from 4 to 6 cables westward of Deep-water point, with the channel between. Mame chau islets are connected with Deep-water point by a sand-flat, as before stated; thence eastward of a line joining Deep-water point to Tip chau, and to the fort, the water is shallow.

A bank with less than 3 fathoms projects southward towards the anchorage from about the middle of the bay; its south-east extreme, bordering the anchorage, lies 6 cables south-west from the fort.

**Directions.**—There is no difficulty in entering Hui ling san harbour; the only danger is the shoal with  $2\frac{1}{4}$  fathoms water on the port hand, westward of Deep-water point.

Mame chau island and Deep-water point should be passed at the distance of rather over a cable, and anchorage taken in about 7 fathoms, with the south extreme of Tip chau bearing  $73^\circ$  true about 4 cables. There is anchorage as far up as abreast the fort in 4 to 5 fathoms. Vessels of light draught can haul in under Deep-water point, where there is anchorage in the bight in about  $2\frac{1}{2}$  fathoms, or in the boat harbour within Tip chau, where there are depths of 8 to 9 feet.

**Supplies.**—In the bay between Tip chau and Deep-water point, adjacent to a joss-house in ruins, fresh water may be procured.

Chino village, situated on the south-east side of the boat harbour, affords supplies of water and provisions. Carpenters and caulkers may be got to work on board, and smith's work can be executed at the village.

**OFF-LYING ISLETS.**—**Mandarin's Cap** (*Lat.  $21^\circ 28' N.$ , Long.  $112^\circ 21\frac{1}{2}' E.$* ), or Fan shi ak, is a barren white rock, about 200 feet high, with a sharp summit, situated about 28 miles east-south-westward of the Sugar Loaf on Hui ling san. At half a mile northward of it is a high rock with a rock awash between; in other places there are depths of 13 to 16 fathoms around the Cap.

**Currents.**—During the north-east monsoon period, and also in August and September, when easterly winds frequently prevail, the current sometimes sets to the westward at the rate of 3 miles an hour off Mandarin's Cap, abating only to  $1\frac{1}{2}$  miles when the tidal stream, under ordinary circumstances, would be setting to the eastward. Frequently in the south-west monsoon, if the wind shifts to the eastward, a westerly set is experienced.

*General chart 2661a.*

*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

**Nampang island**, 10 miles north-westward of Mandarin's Cap, is about  $1\frac{1}{2}$  miles in length and 780 feet high at its west end. It is safe to approach, having 9 to 10 fathoms near the shore all round, but is destitute of fresh water.

**Round island**,  $3\frac{1}{4}$  miles westward of Nampang, 310 feet in height, is small and named from its appearance. About 2 miles south-south-west of it, there are two rocks; the southern is about 30 feet in height, and the northern about 10 feet. Between the nearest rock and the island there is a depth of 10 fathoms.

**Quoin** is an islet, 270 feet high, resembling a gunner's quoin, lying near the east side of Ni wok island, about  $2\frac{3}{4}$  miles northward of Nampang; in the passage between it and the latter, the depth is 8 to 9 fathoms. There is a rock 40 feet high westward of the Quoin.

**Ni wok** is 390 feet in height, and about a mile in length, with a sunken rock south of its east extreme.

**Tai wok**, about  $1\frac{1}{2}$  miles northward of Ni wok, is 345 feet high, appearing like a saddle when viewed from the south-west. At one mile  $214^\circ$  true from Tai wok, there is a rock awash at low water with a depth of about 8 fathoms all round, and on which the sea sometimes breaks.

Westward of a small temple near the beach, in the little bay on the north side of Tai wok, fresh water can be procured.

**COAST.—Tai oa point and bay.**—Tai oa point lies about 16 miles eastward of Hui ling san island; between is Deep bay. The depths decrease regularly from Mandarin's Cap, 15 miles in the offing, to 4 fathoms close to Tai oa point.

In Tai oa bay, close north-westward of the point, the water is shallow; but small craft find shelter close off the village, in 2 fathoms. Rocks covered at high water lie about a mile south-west of the island in Tai oa bay, with 4 to 5 fathoms around them, and there are sunken rocks eastward of the island and in the bay, which has not been surveyed.

The village of the same name within the point is the residence of a mandarin.

**Deep bay**, westward of Tai oa point, is fronted by shallow water extending about 2 miles in its eastern and 4 to 5 miles in its western part, but it has not been surveyed. The village of Yong Kong is shown on the chart as being situated about 3 miles up the river which enters the bay between the forts on either side of the entrance.

**Shallow bay.—Mong chau** (*Lat.  $21^\circ 39' N.$ , Long.  $112^\circ 7' E.$* ), situated about  $6\frac{1}{2}$  miles south-eastward of the point of the bay eastward of Tai oa point, is on the edge of the 3-fathoms contour line

*General charts 2661a, 1263.*

*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

stretching out to Haucheun, distant 5 miles south-east of it. The bay extending north-eastward of Mong chau, within Haucheun and St. John islands, is mostly shallow. Hai yu island occupies a portion of it, westward of which there is an inlet to Tai wu san, with depths of 4 to 5 fathoms, but with only from one to 2 fathoms in its approach on either side of Mong chau.

Mong chau is a high island, about  $2\frac{1}{2}$  miles in length, and covered with verdure. There is a village near its summit, only visible from the south-east; some rocks extend off its north-east point to the distance of nearly  $1\frac{1}{2}$  miles. A rock 30 feet high lies about a mile south-east of its south extreme.

Small vessels may anchor in 3 fathoms at low water, on the west side of this island during easterly winds; and fresh water may be procured at a small beach on that side, near the south point.

**HAUCHEUN ISLAND**, situated about 12 miles north-eastward of Mandarin's Cap, is a high island,  $10\frac{1}{2}$  miles in length in a north-east and south-west direction, by about 3 miles in breadth.

**Anchorage.**—Its south-west extreme, Haucheun bluff, has a depth of 7 to 8 fathoms close to; and close round it on the west side there are two small bights, with sandy beaches, having 3 fathoms water, where small vessels may take shelter during the north-east monsoon period; larger vessels also will be sheltered from easterly winds by anchoring in 5 or 6 fathoms, soft mud, about a mile off the southern bight.

This anchorage is generally known as Haucheun road or bay.

A few bullocks may be obtainable at the village, and fresh water in the southernmost bight. The town of Haucheun is on the eastern side of the island, and where supplies are also obtainable.

*Plan of Namu harbour on 2212.*

**NAMO HARBOUR** (*Lat. 21° 36' N., Long. 112° 33' E.*) lies between the south-west end of Haucheun and Namu island, and although small, it is safe and convenient for refitting a vessel of small or even moderate draught, or one otherwise requiring shelter.

Namu island is  $1\frac{1}{2}$  miles in length, and 500 feet in height, with Passage islet close off its south-west extreme, which is connected with it by reef; rocks extend half a cable westward of Passage island. Rocks, some above water, extend about 3 cables off the south-east side of Namu.

**The south entrance** is preferable to the eastern entrance for vessels above 16 feet draught, having 6 fathoms water, gradually decreasing to the sandy beach at Namu village, at the head of the harbour, and is free from danger. This entrance is three-quarters of

. *General charts 2212, 2661a, 1263.*

*Plan of Namu harbour on 2212. Var. 0° 25' E.*

a mile wide, having Passage islet on the east side, and the eastern extreme of Haucheun bluff peninsula on the west.

**Anchorage.—Directions.**—With an easterly wind, the best anchorage is under Namu island, at about midway between Passage islet and Green point; here the depth is  $4\frac{1}{2}$  fathoms, soft mud, about half a mile off. When it blows strong, a long ground-swell rolls in, rendering it necessary to anchor in the western part of the harbour, where there are depths of  $4\frac{1}{2}$  fathoms, mud bottom.

In entering it is only necessary to give a berth of about 2 cables to Passage islet, to avoid the rocks that extend half that distance from it.

**The eastern entrance**, between Namu island and the south-east part of Haucheun, has a depth of 3 fathoms on the bar which connects the island with Haucheun; this passage is much encumbered with fishing stakes, but there are openings about 100 feet wide in places.

**Anchorage.—Directions.**—The best berth for a small vessel is abreast the sandy beach on the north side of Namu, which forms Green point; not so far northward as to open the south entrance. In this berth there is not less than 3 fathoms at low-water springs. Although slightly exposed to the easterly wind, no swell of consequence comes in.

In entering, the rocks, mostly above water, extending 3 cables south-eastward of Namu island at 3 cables from its east extreme should be given a berth. Coming from the eastward, pass southward of Boat rock, always above water; thence in mid-channel to the anchorage mentioned, or farther westward off the village, if desired.

**Tides.**—It is high water, full and change, in Namu harbour, at about 10h.; springs rise 7 to 8 feet.

**Supplies.**—There are several watering places about the harbour. the largest and most convenient of which is in Watering bay, a sandy bay on Haucheun; here the water comes close to the beach.

Namu village is situated at the north head of Namu harbour, westward of Watering bay. Fish, poultry, &c., are procurable. There is considerable surf on the beach during strong southerly winds; it is then advisable to land at Watering bay.

*Chart 2212, Tien pak to Macao.*

**THE FIVE ISLANDS**, situated off the east side of Haucheun, are mostly small, and form the west side of the channel between it and St. John. Boat rock, situated in lat.  $21^{\circ} 35' N.$ , long.  $112^{\circ} 38\frac{3}{4}' E.$ , about half a mile southward of Round islet, the southernmost of the group, is never quite covered, and the sea generally breaks over it.

*General charts 2212, 2661a, 1263.*

*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

Wasp island, the next northward of Round islet, is the largest of the group, and has some rocks close to its south-east side. Cricket, the third island, is high, and covered with grass. The fourth, Pipa-chau, is covered with grass, having rocks above and below water extending from its south end.

**Anchorage.**—There is no hidden danger near these islands, and a vessel of 15 feet draught will find sheltered anchorage between them and Haucheun, in 3 fathoms, soft ground.

**Supplies** may be obtained from the town of Haucheun, situated in the bay fronting the islands.

All the space between these islands and St. John is apparently free from danger, with depths of 5 to 6 fathoms, soft ground, and where vessels can find shelter according to the prevailing wind. The tidal streams are strong at springs, the ebb setting southward and the flood northward through the channel; at neaps they are weak.

**ST. JOHN ISLAND**, or Chang cheun cham, is about 14 miles in length, in a north and south direction; near its centre it is nearly divided into two islands, the low sandy isthmus connecting the two high portions being less than a mile wide.

The bay eastward of the isthmus is known as Sanki bay, whilst that to the westward is Sandy bay.

**Waikaup** is a high, rocky island, fronting the south-east end of St. John island, being separated from it by a narrow passage. There are said to be depths of 13 to 14 fathoms water close to this island.

*Plan of Shito bay on 2212.*

**Shito bay**, on the south-west side of St. John, is about 2 miles in length, and three-quarters of a mile in breadth at the entrance, with a depth of 6 to 7 fathoms, decreasing to 4 fathoms abreast a rock 4 feet high, half a mile below Satie village; it has not been closely sounded.

There is a watering place at the south side of the entrance.

Between Shito bay and the south point of St. John there is a small bay, having 6 fathoms water; some rocks, which are steep-to, extend about a mile off its south-west point.

*Chart 2212, Tien pak to Macao.*

**Gunjavar channel** is the passage between St. John island and the bank fronting the mainland to a distance of about 6 miles; it is about 2 to 3 miles wide, with depths of 4 to 4½ fathoms over soft bottom, and somewhat deeper in the entrances; it is probably a good typhoon anchorage. Its western end has been mentioned in connection with the Five islands.

*General charts 2661a, 1263.*



*Chart 2212, Tien pak to Macao. Var. 0° 25' E.*

The only known dangers are the patch of  $2\frac{1}{2}$  fathoms, situated half a mile north-west of the outer islet in the bay on the north-west side, and in which is the village of Samtong, and the rocks awash or above water and steep-to, about a mile off the north-east point of St. John island, south side of the eastern entrance.

The village of Samtong affords small quantities of supplies.

**Eastern side of St. John.—Rocks.**—A rock, visible only at low water, lies about half a mile off the north-east point of Chau wan. Islets and rocks extend  $1\frac{1}{2}$  miles off the south point of Sanki bay, as charted, and there is a reef on which the sea breaks at times, marked P.D., at about half a mile off the south-eastern shore, abreast Satie. The general depths off the eastern side of the island are from 9 to 10 fathoms.

**Liuchiu** (*Lat. 21° 36' N., Long. 112° 52' E.*) is an island  $2\frac{1}{2}$  miles in length east and west, of moderate height and barren aspect, separated from the south-east part of St. John by a channel  $2\frac{1}{2}$  miles wide, with a depth of about 12 fathoms; there is said to be deep water close to the island all round. A rock above water lies close off its north-west end.

*Charts 2562, 2212.*

**Tidal streams.**—Outside these islands the flood stream runs eastward, from  $1\frac{1}{2}$  to 2 knots an hour. Inside, it is rather stronger. The rise is about 6 feet.

**TAIKAM ISLAND**, situated about 11 miles north-eastward of St. John island, is of considerable height, of dark aspect, and in clear weather appears with red streaks. On the south part, in a small bay, behind a mound of sand near the beach, there is a village, and fresh water may be obtained at the western side of the beach. Between this island and Tonkwa, the large island to the north-westward, the depths are 3 fathoms and less.

**Wizard rocks** lie off the south end of Taikam; the White Wizard lies one mile, and the South Wizard 3 miles southward of Taikam. Three-quarters of a mile south-west from the White Wizard there is a rock covered at high water. There is another rock, always above water, one mile  $282^\circ$  true from the White Wizard.

**The Flies**, from three-quarters of a mile to  $1\frac{1}{2}$  miles southward of the South Wizard, consist of a group of rocks about 30 feet high, with a depth of 10 fathoms, mud bottom, at the distance of a cable seaward of them. They should be given a wide berth, as there are no soundings charted for many miles seaward.

*General charts 2661a, 1263.*

*Charts 2562, 2212. Var. 0° 25' E.*

**Kukok** (Bullock horn), the next island eastward of Taikam, is high, and  $4\frac{1}{2}$  miles in length, east and west. Its south-west point, in lat.  $21^{\circ} 51' N.$ , long.  $113^{\circ} 8' E.$ , has a rock about 15 feet high close to it. Under the high west side of the island there is a good anchorage in a depth of 5 fathoms, with shelter from north-easterly winds, at  $1\frac{1}{2}$  miles off; a patch of  $4\frac{1}{2}$  fathoms is charted, with 6 fathoms around, at 3 miles westward of the island.

Fresh water may be obtained at the westernmost bay on the north side of the island.

**Kau lan**, a high island, is separated from Kukok by a channel about 2 miles wide, with 3 fathoms water, decreasing gradually to the northward, and affording sheltered anchorage for small craft. Sunken rocks extend a short distance off the south-east side of the island in places.

Sam long islet (*Lat.  $21^{\circ} 55' N.$ , Long.  $113^{\circ} 19' E.$* ) lies  $1\frac{1}{2}$  miles eastward of the east point of Kau lan, with two islets situated from a half to one mile north-east of it.

Within Kukok and Kau lan are Tai mong, Sam hoi chuk, Talong kong, Tai lum, Tai fu, Cone, and other islets, all surrounded by shallow water, for which *see* the charts. Sam chau, the easternmost island, forms the west side of the approach to Si kiang or West river, and is dealt with below.

**Nam sui harbour**, about  $2\frac{1}{2}$  miles long, and from one to  $1\frac{1}{2}$  miles broad, is situated between the islands of Lam puk sui and Sam hoi chuk, at the western side of the entrance to the Si kiang or West river.

The harbour affords anchorage in depths of from 9 to 16 feet over a space about 2 miles long, in a north-east and south-west direction, and from 2 to 3 cables broad, sheltered from all winds except N.E. The entrance is from the eastward, avoiding a shoal with a depth of 6 feet extending from the south entrance point; the western entrance is obstructed by the small island of Kie sum chau and the shoal water extending to the reclaimed land on either side of it.

Puk sui is a village situated on the south-west point of Lam Puk sui; Nam sui, with a population of about 1,000, is built on the north side of Sam hoi chuk. Both these islands are hilly.

*Chart 2562, Canton river, &c. Var. nil.*

**SI KIANG or WEST RIVER.**—General remarks.—This river, also known as the Blue river, is some 700 miles in length from its source to the mouth of the Broadway, its principal entrance, between Wung kum island and Ross island.

*General charts 2061a, 1263.*

*Chart 2562, Canton river, &c. Var. nil.*

Just westward of Samshui reach, 75 miles from the sea (which connects West river with North river), the river trends westward past Wu chau fu, Teng hsien, Ping nan, &c., to near Hsun chau fu, where it turns southward past that city under the name of the Yu kiang. At Hsun chau fu the main river, known as the Wu or Hong kiang, turns sharply north-westward and northward, and is joined a long distance up by the Liao chau river; the main stream westward of this is known as the Hong chui kiang, or Red Water river; it continues in a north-westerly direction to its source on the borders of Yun nan.

The Yu kiang, or Nan ning river, from Hsun chau fu, trends in a westerly direction to Nan ning fu, near which it is joined from the southward by the Tso kiang, or Lung chau river. From near Nan ning fu, the Yu kiang trends north-westward to Posé, known also as Posé river. The trade of the province of Kwangsi follows the course of the Si kiang, or West river, excepting that from Lung chau, which owes its importance (but little apparently) to its trade through Tong King by the French railway system.

From Samshui reach, which, as above mentioned, connects the Pe kiang or North river with West river, are the Fat shan and other branches leading to Canton river. At the towns and villages on the rivers the British and Mexican dollar are current. *See* Chinese weights and measures in preliminary pages.

**Navigability.**—Vessels of 13 feet draught can reach Wu chau fu, about 180 miles above the entrance, at high river (June), and 6 to 7 feet at low river. To cross Second bar and the shoal water below Wu chau at all times of the year vessels should have a draught not exceeding 5 feet, and good steering qualities. For rise of river and navigability above Wu chau fu, *see* page 396.

### WEST RIVER REGULATIONS, 1905.

*(Taken from the China Coasters' Tide Book and Nautical Pocket Manual, 1911.)*

Art. I. *Former Regulations Rescinded.*—The Regulations of trade on the West river hitherto in force are hereby abrogated.

Art. II. *Ports, Stages, or Ports of Call, and Passenger Stations.*—The merchant vessels of the Treaty Powers are authorised to trade on the West river at the following four Treaty Ports:—

Canton (directly connected with the West river), Kong mun, Samshui, and Wu chau fu.

*Steamers* are authorised to land and ship goods in accordance with *General charts 2661a, 1263.*

regulations hereinafter set forth at the following six stages or ports of call:—

Kum chuk, Paktau hau, Shiu hing, Lotinghau, Tak hing, and

Do sing,

and to land and ship passengers and their luggage at any of the following 10 regular passenger stations:—

Yung ki (in Tailung channel), Mahning (in Junction channel),

Kau kong, Kulau, Wingon, Howlik, Luk pu, Yuetsing, Luk to, and Funghuen (in West river).

Passengers' luggage must not contain articles subject to duty, and the presence of dutiable articles will render the whole liable to confiscation.

Art. III. *Arms Certificate*.—Vessels proposing to trade on the West river must provide themselves with an arms certificate. This certificate, which is to be made out on a form supplied by the Customs and signed by the Captain, must state the number of muskets, guns, swords, &c., and the quantity of ammunition carried for self-defence, and be produced for inspection and verification when required.

Art. IV. *Classes of Vessels*.—Merchant vessels trading on the West river are to be divided into the following classes:—

- |               |   |   |
|---------------|---|---|
| A. Steamers - | { | (1) <i>Inland water steamers</i> trading to permitted inland places.  |
|               | { | (2) <i>Local river steamers</i> running from Canton, Kong mun, or Samshui to ports up river without leaving Liang Kwang waters. |
|               | { | (3) <i>Foreign-going steamers</i> from and to Hong Kong, Macao, &c., trading for the voyage up and down river.                  |
| B. - - -      |   | <i>Small craft, lorchas, papicos, junks, &amp;c.</i>  |

Art. V. *A. Steamers*.—

1.—*Inland water steamers* are to comply with the Inland Waters Steam Navigation Regulations.

2.—*Local river steamers*, which do not leave Liang Kwang waters, but which running from Canton, Kong mun, or Samshui are to trade only at treaty ports and ports of call, and take passengers to and from the authorised passenger stations, are to deposit their registers with their Consul, or (if consularly unrepresented) with the Customs at Canton, Kong mun, or Samshui, where the Customs, on receipt of a Consular application or on deposit of her papers, will issue a certificate to the steamer to be called the "River Pass," on which shall be entered the steamer's name, flag, and registered tonnage, the said "River Pass" to be valid for the year during which issued, on expiry of which it must be either surrendered or renewed at the port of issue.

*General charts 2562, 2661a.*

3.—*Foreign-going steamers* from and to Hong Kong, Macao, &c., proceeding to the West river, must enter either by (a) Mo to mun (Broadway), (b) Wang mun, or (c) viâ Canton.

(a) If entering by Mo to mun they must report at the Malow chau station (Lappa Customs) and produce for inspection and verification a general import manifest of all cargo on board, showing destination. The Customs official will inspect the vessel on arrival, note the quantity of arms, &c., on board, and issue the "Kong mun Pass," upon receipt of which the vessel will proceed direct and without anchoring, landing or shipping cargo or passengers, to Kong mun and surrender the pass. If proceeding further up the West river, steamers will deposit their registers with their Consul or (if consularly unrepresented) with the Customs. Upon receipt of the Consular report, or on deposit of her papers, the Customs will issue a certificate to the steamer, to be called the "Special River Pass," on which shall be entered the steamer's name, flag, and registered tonnage, and without which she may not proceed to any treaty port (the original port of entry excepted), port of call, or passenger station on the river. On return to Kong mun, and when all dues and duties are either paid or accounted for, the Customs on surrender of the "Special River Pass" will issue a clearance which will entitle the vessel to the return of her register and Kong mun Pass. The vessel is then free to depart viâ the Mo to mun (Broadway) or viâ the Wang mun as provided for below (b). Proceeding viâ the Mo to mun (Broadway), the Kong mun Pass will be surrendered at the Malow chau station (Lappa Customs), where the general export manifest of all cargo on board will be produced for inspection and verification.

(b) If entering by Wang mun, steamers must report at the Wang mun station and comply with the requirements set forth above (a). According to the destination declared the "Kong mun/Samshui Pass" will then be issued, upon receipt of which the vessel will proceed by the authorised route, direct and without anchoring, landing, or shipping cargo or passengers, to the port indicated on the Pass, where the latter will be surrendered. If proceeding elsewhere on the West river, steamers will deposit their registers with their Consul or (if consularly unrepresented) with the Customs. Upon receipt of the Consular report, or on deposit of her papers, the Customs will issue a certificate to the steamer, to be called the "Special River Pass," on which shall be entered the steamer's name, flag, and registered tonnage, and without which she may not proceed to any treaty port (the original port of entry excepted), port of call, or passenger station on the river. On return to the original port of entry, and when all dues and duties are either paid or accounted for, the Customs on surrender of the "Special River Pass" will issue a clearance which will entitle the vessel to the return of her register and "Kong mun/Samshui

Pass." The vessel is then free to depart viâ the Wang mun or viâ the Mo to mun (Broadway), as provided for above (a). Proceeding viâ the Wang mun, the "Kong mun/Samshui Pass" will be surrendered at the Wang mun station, where the general export manifest of all cargo on board will be produced for inspection and verification.

(c) If entering viâ Canton, vessels will proceed by the authorised Bogue (Main river) route direct and without anchoring, landing, or shipping cargo or passengers, and deposit their register with Consul or Customs at Canton in order to obtain the "Special River Pass," without which they may not proceed to any treaty port, port of call, or passenger station on the West river, and the surrender of which on return, all dues and duties having either been paid or accounted for, will entitle them to Customs clearance and return of register.

4.—*Shipment and discharge of cargo* by local river steamers and foreign-going steamers at any other points on the river than the treaty ports and ports of call enumerated in Art. II. is prohibited, and any violation of this prohibition will be dealt with in accordance with the Treaty provisions applicable to clandestine trade along the coast.

5.—*Local river steamers and foreign-going steamers* trading at the West river ports—Canton, Kong mun, Samshui, and Wu chau fu—must report and clear and load and discharge cargo in the same manner as at other treaty ports along the coast, and in accordance with the Customs Regulations of the river ports concerned.

6.—*Duty treatment* of merchandise carried by local river steamers and foreign-going steamers:—

A.—*Foreign Trade.*

*Import Duty* shall be payable as follows: On cargo from abroad for—

- (a) a Treaty Port .....at destination Treaty Port.
- (b) a Port of Call .....at Port of entry from abroad  
(Kong mun, Samshui, or Canton).

*Export Duty* shall be payable as follows: On cargo for abroad from—

- (a) a Treaty Port .....at port of shipment.
- (b) a Port of Call .....at port of clearance for abroad  
(Kong mun, Samshui, or Canton).

B.—*Domestic Trade.*

*Export (full) and Coast Trade (half) Duties* shall be payable as follows: On cargo from—

- (a) Treaty Port to { Full at port of shipment and half at port  
Treaty Port. { of discharge.
- (b) Treaty Port to { If another treaty port is to be passed en  
Port of Call { route, full and half at port of shipment,  
otherwise full only at said port of shipment.

*General charts 2562, 2661a.*

- (c) Port of Call to Treaty Port. { If another treaty port has been passed en route, full and half at destination treaty port, otherwise full only at said port.
- (d) Port of Call to Port of Call. { If a treaty port is passed en route, full at said port in passing.

7.—*Tonnage dues* are payable once every four months at the treaty port first touched at after expiry of certificate.

8.—*Dues and duties* are in general payable at other treaty ports, and re-exports and goods under transit Certificate entitled to usual Customs treatment. Native goods, if shipped to a treaty port and subsequently re-exported to a foreign port within 13 months, with no unauthorised change of package and marks, will be entitled to the refund of any Customs duty paid in excess of one full export duty.

9.—*Routes*: The following are the authorised routes to the West river; foreign-going steamers proceeding from the sea direct must either enter by—

(a) *the Mo to mun (Broadway) route*: or by

(b) *the Wang mun route*, taking the Sailam channel and Junction channel and passing into the West river at First Cliffs.

Such steamers may also proceed (c) *viâ Canton*, in which case they will be required, together with local river steamers, to take the following route on leaving Canton, viz.: Hill passage, Saiwan channel, Tailung channel, and Junction channel (Brit. Admiralty Chart N. 2562), and enter the West river at First Cliffs. Returning abroad, or to Canton, the same routes are to be adhered to.

10.—*Miscellaneous*: The Customs officials will be at liberty to seal the hatches of vessels entering or trading on the West river, and seals must not be broken before the vessel reaches the next port or port of call at which she wishes to work cargo. Any trading vessel falling in with a revenue cruiser or Customs boat is to produce her papers for inspection, if examination of them is required, and Customs employés may be put on board vessels to search them or accompany them for the purpose of surveillance.

11.—*Penalties*: Vessels taking other than the prescribed routes into or out from the West river, or found in waters between Canton and Kong mun on the Bogue passage (Boca Tigris), and Kong mun anywhere off the said routes, are liable to a fine not exceeding Tls. 500. In the event of any vessel so found, or discovered anywhere on the West river and routes thereto inside Malow chau or Wang mun stations, being without proper papers as provided for by the present regulations, she will be dealt with under the Treaty Articles penalising clandestine trade along the coast.

*General charts 2562, 2661a.*

Foreign-going vessels bound out and failing to surrender the "Kong mun/Samshui Pass" at "Malow chau/Wang mun" are liable to a fine not exceeding Tls. 100.

Infringement of river port regulations by local river steamers will be punished by the infliction of penalties in force at other treaty ports. For a second offence the "River Pass" may be cancelled, and the steamer refused permission to trade on the West river. Unauthorised opening of sealed hatches or breaking of seals will entail liability to a fine not exceeding Hk. Tls. 500.

Art. VI. B. *Small craft* (lorchas, papicos, junks, &c.) entitled to trade at treaty ports, but not at ports of call nor at passenger stations on the West river.

(a) *Lorchas, &c.*, owned by foreigners, if provided with registers and entitled to fly national flags, are required to take out a "Special River Pass," either through the Consulate or through the Customs direct at Kong mun, Samshui, or Canton if proceeding to other river treaty ports; they will report, work cargo, pay duties, and observe all conditions as regards papers, routes, &c., and be subject to the same penalties for the infringement of rules and regulations as foreign-going steamers on the West river.

(b) *Papicos, &c.*, owned by foreigners but not provided with registers or entitled to fly national flags, are to take out Customs registers at the port they belong to and report, work cargo, and pay duties in the same way as lorchas. They are subject to the same penalties for infringement of rules and regulations.

(c) *Chartered Junks*.—Chinese junks chartered by foreigners must take out special junk papers at the Customs to be obtained in exchange for bonds executed at and deposited with the Customs, the condition of the bond being that cargoes are bonâ-fide foreign property, and will be landed and pay duty at a treaty port, and the penalty that if the cargo fails to be so landed and pay duty no chartered junk will thereafter be cleared for the foreigner in question. Such junks to report, work cargo, observe all conditions, fulfil all requirements, and pay duties in the same way as lorchas, papicos, &c.

The above regulations are open to revision when and if necessary.

CUSTOM HOUSE,

Canton, April, 1905.

**Treaty ports.**—Samshui, with Kong mun, Kongkun, Wu chau fu, and Nanning, are treaty ports, with freedom for navigation between Samshui, Wu chau fu, Hong Kong, and Canton by a route from each of these latter places to be selected and notified in advance by the Imperial Maritime customs.

Also Kum chuk, Shau king, Lu pu, Yuet sing, Luk tau, Tak hing, and Do sing, are all ports of call for goods and passengers. For position of these, refer to Index, and see the preceding Regulations for West river.

*General charts 2562, 2661a.*



*Chart 2562, Canton river, &c. Var. nil.*

**THE BROADWAY** is the main estuary of the Si Kiang, and its eastern entrance.

(The **Fu Tui mun** and the **Ngage mun**, westward of it, are the other mouths, the latter leading to **Kong mun** and joining the main stream at **Chau lin island**; they are probably available by boats or small junks, but there is no information at hand concerning these entrances.)

**Lu lu creek**, the continuation northward of the **Fu Tui mun**, from about lat.  $22^{\circ} 21' N.$ , was examined by the *Sandpiper* in passing through in November, 1908. From Oyster barrier, with 6 feet water, leading eastward to **Holmes creek** at its southern end, it is about 6 miles long to where it connects with **Holmes creek**, and from thence it runs northward past **Moorhen creek** to the main river. There is apparently only 6 feet water in the fairway abreast **Chung sui shan** northward of the island which divides the fairway, and there is a rock with 2 feet water at  $1\frac{1}{2}$  miles from its southern entrance; the eastern shore should be kept proceeding northwards; the channel used, that westward of the island, has about 8 feet least water, but is very narrow, and obstructed by sunken groynes. It should not be used without the assistance of a pilot.

The approach to the **Broadway** is between **Ross island**, eastward of **San chau island**, and **Morgan point**, the west extreme of **Wung kum island**, where it is about 2 miles wide. The fairway depth in the **Broadway** is reported to be not less than 10 feet (1911), but in the approach there are many isolated patches, so that it is only available with local knowledge; it is used by small steamers up to about 9 feet draught and trading junks, during daylight. The best time to enter is with the first of the flood. There are usually lines of fishing stakes across the entrance, with passages between them.

#### ISLANDS in the approach.

**San chau** (*Lat.  $22^{\circ} 2' N.$ , Long.  $113^{\circ} 22' E.$* ), an island about 5 miles in extent, is situated on the western side of the entrance. **Ross island** lies off its north-east extreme, narrowing the entrance; southward of **Ross** are the **Double islands**, **Coffin**, **South-west island**, and the **Stragglers**, the latter lying within a mile of the south-east extreme of **San chau**. The 3-fathoms contour is reported to extend farther off the entrance to the **Broadway** than is charted, but this does not affect vessels entering the river.

**Wongkam** or **Wung kum island**, or **Lu wan hao shan**, on the eastern side of the **Broadway** entrance, is 3 miles in extent and 1,950 feet high; **Colowan** or **Koho island**, 410 feet in height, lies close north-eastward of it.

Water islets, or **Ching lung shan**, two in number, lie close off the southern end of **Wung kum**; Inside islet is one mile north-westward of them, and **Lark bay** is a bight between it and **Morgan point**, the western extreme of **Wung kum**.

**Dom João**, **Macarira island**, or **Toi ko ke tou**, lies northward of **Wung kum**, **Massie point**, its western end, being about  $1\frac{1}{2}$  miles from **Morgan point**.

**Mong chau**, or **Ballast island**, lies three-quarters of a mile north-westward of **Massie point**. The old fort on **Ballast island** is conspicuous; it is a square white tower, and a custom's station, consisting of white buildings on the middle hill of the island, is also noticeable.

*General charts 2661a, 1263.*

*Chart 2562, Canton river, &c. Var. nil.*

**Lappa, Tui lien shan** or Patera island, lies northward of the above-mentioned island, and is separated from Macao island northward of it by a boat passage. Westward of it, on the eastern side of the Broadway, is Ma on shan, a hill 695 feet in height.

**Taipa island**, eastward of Macarira, and the Malo chau pass from Macao to the Broadway, are described on pages 434 and 436.

**Shoals.**—From a recent examination of the entrance (1911), a shallow sandbank, 2 miles in length, has formed in the entrance to the Broadway, its north extreme being about midway between Ross island and Inside island; the best water is eastward of it.

Rocks awash at low water lie about midway between Inside island and Morgan point, east side of the channel.

A rock awash at low water lies on the eastern side of the channel,  $321^{\circ}$  true,  $1\frac{1}{4}$  miles from Morgan point; and a rock awash at low water, on the west side of the channel, at  $1\frac{1}{10}$  miles westward of the other.

A patch of 2 feet is charted in the fairway about three-quarters of a mile above those rocks; no marks can be given for avoiding them.

**Tides and tidal streams.**—It is high water, full and change, at the entrance of the Broadway, at 11h. 0m.; springs rise  $7\frac{1}{2}$  feet. The neaps are very irregular, there being then only one tide during the 24 hours. The rise apparently is very much greater at Macao, only about 7 miles to the eastward.

The direction of the flood stream outside is governed principally by the winds; with strong easterly winds it runs west-north-westward, and with south-westerly winds it runs northward. The ebb stream runs generally south-westward. Inside the river the tidal streams take the direction of the channel.

**GENERAL DIRECTIONS.**—The Broadway should not be entered without a pilot unless acquainted with it. The best channel, according to the chart, is to approach with Morgan point open of Inside island about  $338^{\circ}$  true, and from abreast Water island steer to pass across the bar, with 10 feet at low water (1911), subject to change at about half a mile westward of Inside island and of Morgan point. From abreast the latter, Inside island summit bearing  $138^{\circ}$  true, astern, apparently leads between the two rocks awash and close westward of the 2-feet patch. When Old Fort, on Mong chau, bears  $34^{\circ}$  true, steer up for west extreme of Ma on shan, bearing  $349^{\circ}$  true until abreast of Old Fort, when a course about  $328^{\circ}$  true for the fort on the west extreme of Mo to leads to the entrance of West river, abreast the joss-house.

**Si kiang, or West river.**—From the Broadway the mouth of the Si kiang is entered between the joss-house, on Sheong ma kok, and the reclaimed land south-eastward of Creeper island, and eastward of Tai kok.

*General charts 2212, 2661a.*

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*Chart 2562, Canton river, &c. Var. nil.*

Above this, Mo to mun or Mo to pass, the main channel, is on the western side, between Creeper island and the reclaimed land northward of Mo to; it has about 4 fathoms water.

Proceeding up river, from about half a mile westward of the joss-house above mentioned, steer for Stripe cliff, westward of the central shoal of 6 to 8 feet, which is said to be extending southward. A large portion of the bank in mid-stream northward of this shoal has been reclaimed to a little below Mo to fort, and is under cultivation; give the southern part of it a fair berth, passing westward of it. Above Stripe cliff keep the western bank aboard to the north end of Chuk chau, where a sandbank, on which the greatest depth at low river is about 7 feet, is crossed. From Chuk chau, pass on either side of the island in the fairway, thence follow the eastern bank to Kep seang island (*Lat. 22° 29' N.*), abreast which the depth is 2 fathoms.

(Close westward of Mo to fort is the approach to the narrow Nemesis channel leading into Wang mun, Canton river.)

Chuk chau forms the west side of entrance to 'Moorhen channel, which trends north-westward, more or less parallel to the main river, and re-entering it in about *lat. 22° 32' N.* A spit extends about three-quarters of a mile from Chuk chau in the direction of the creek, leaving a narrow channel only between it and the eastern point of the entrance abreast.

At 11 miles above Lo chau or Creeper island, on the west bank, is a branch leading to the district town Sun wei (*Lat. 22° 27' N., Long. 113° 3' E.*), the position of which is marked by a conspicuous pagoda on a hill; and from the vicinity of Kep seang island the pagodas of Liao si wan eastward, and the hill pagoda of Tai lung to the northward, are remarkable.

(In November, 1902, H.M.S. *Sandpiper* visited Sun wei, and Sun cheong 27 miles further west; navigation was easy.)

From abreast Kep seang island keep in mid-channel, where the depths are about 4 fathoms and more to Ngai hai village, on the point on the south side of the channel leading westward to Kong mun creek, southward of Chau lin island.

**Approach to Kong mun.**—The eastern channel to Kong mun, southward of Chau lin island, is said to have a least depth of  $2\frac{1}{4}$  fathoms off the southern part of Edgell island (not borne out by the chart, which gives 7 to 9 feet). Entering from the river, keep in mid-channel until abreast a large joss-house on the southern bank, then haul over to that bank to avoid a spit extending from the south-eastern part of Chau lin, and keep this side passing southward of Edgell island into the anchorage between that island and Kong mun creek. The depth decreases from 4 fathoms off the joss-house to  $2\frac{1}{4}$  fathoms in the narrow pass, southward of Edgell island; this pass, through which the stream runs rapidly, is named Li yuk tsui (The corps mouth). After passing Li yuk tsui anchor in 12 feet between

*General charts 2661a, 1263.*

*Chart 2562, Canton river, &c. Var. nil.*

it and Pak shik haon (White stone mouth), the northern entrance point to Kong mun creek.

In the approach to Kong mun creek, northward of Chau lin, there is a patch of 8 feet in the fairway, and a shoal, with from 1 to 2 feet water, extends nearly a mile north-west of Edgell island, westward of which the depth in the channel is about 9 feet.

**Kong mun creek** being shallow, cargo is transhipped from steamers and junks into boats for conveyance to the town, which is about 2 miles up the creek. Timber and bamboo rafts are also found there. The chief exports are apparently timber, bricks, bamboo fans and furniture; the main import, rice. Provisions are scarce at Kong mun.

**Kong mun city** has a population of about 62,000. The foreign settlement is on the right bank of the Si kiang, at the mouth of the channel leading to the city; it consists of a few houses and numerous mat sheds standing on some filled-in ground in the mulberry fields, which extend along the river banks and a considerable distance inland; there is no British consul. The port is in telegraphic communication with all parts of China, and steam vessels regularly visit it; there is daily communication with Macao and Hong Kong. The largest and quickest steam vessels are owned by the combined companies of Messrs. Butterfield & Swire, Messrs. Jardine, Matheson, & Co., and the Hong Kong, Canton, and Macao Steamboat Company; there are several French, Italian, and Chinese vessels.

**Railway.**—The railway to connect Kong mun with the Sunning railway was opened in January, 1912.

**Shipping.**—In 1911 the number of steam vessels entered under general regulations amounted to 685, with an aggregate tonnage of 220,564 tons, and sailing vessels 41, with a tonnage of 7,473 tons; 592 steam vessels, and 23 sailing vessels, were British. About the same number cleared. In addition, there is a large inland navigation trade by means of steam launches, most of the traffic of the districts of San ni and Sunning passing through this port; in the same year 5,691 vessels (nearly all Chinese), of the aggregate tonnage of 118,569 tons, entered.

**Trade.**—In 1911 the value of imports, direct foreign trade, was 4,191,990 Haikwan taels, and that of exports 1,309,902; the value of the tael is 2s. 8 $\frac{5}{16}$ d. English money. See money, &c., in preliminary pages.

**THE MAIN CHANNEL** up West river, above Kong mun, is eastward of Chau lin, with a least depth of 12 feet. It is said that there are rocks off Chau lin opposite Bamboo island. There is a stone pier at Chau kwan, above Bamboo island, on the opposite shore.

**Sandpiper creek**, the southern entrance to which is opposite the channel leading to Kong mun, runs northward and north-westward, and joins the main stream a little below Plover island. The creek varies from 7 to 30 feet in depth, and there formerly was a 6-feet

*Chart 2562, Canton river, &c. Var. nil.*

bar at its northern entrance, but from latest information there is a depth of 22 feet northward of the rock on the southern side. (*Sand-piper*, 1910.)

Sandiper rock, which dries 2 feet, lies about a quarter of a mile eastward of Kitau joss-house, and about a third the distance from the north shore across the river. The passage is south of it, that northward is foul.

Off Hoi chau village, and about a cable from each bank, is Sheung lung rock, with 3 feet water. *See sketch plan on 1519.*

**Plover island** (*Lat. 22° 41½' N., Long. 113° 6½' E.*), about 40 feet high, with a conspicuous house on it, is about 3 miles northward of Chau lin; pass in mid-channel eastward of the island. There is a depth of 2½ fathoms just below the island, and some rocks at Sam niong miu (not charted).

**Staunch island.**—About 4 miles above Plover island is Staunch island, which is small, and so low that when the river is 15 feet above low river at Kum chuk it is covered.

**Light.**—A *red fixed* light is exhibited from a pole surmounted by a black ball on a wooden hut, built on iron piles and painted white, erected on Staunch island. The light is elevated 21 feet, and visible from a distance of one mile.

A rock is situated close to the northern edge of the bank, extending a quarter of a mile northward from Staunch island.

**Channel.**—Pass westward of Staunch island; just north-eastward of Staunch island is Lo sa tau, the southern entrance point of the western end of Junction channel, leading to Canton river (*see page 474*); a shoal extends about half a mile northward of the point.

**Fa chiau.**—About 2 miles northward of this point is Fa chiau island, with navigable channels on both sides of it.

Northward of Fa chiau the river bends westward, and at a distance of about 1½ miles is Tam kong chao, or Opossum island; the channel is northward of it.

Kum chuk, on the creek of same name abreast Fa chiau, and Hau kong, north-westward of Opossum island, ports of call, are towns important as centres of a great silk-producing district.

**From Opossum island** (*Lat. 22° 49' N., Long. 113° 3' E.*) there are two channels, one on either side of the two low flat Ho shan islands, for a distance of about 4 miles. Two rocks, one on each bank are reported to exist in the eastern channel at about half to three-quarters of a mile southward of the northern end of the channel. In using this channel, which has been navigated by a vessel of 9 feet draught, keep mid-way between Ho shan island and the northern bank.

In the western channel, at 1½ miles westward of Opossum island, is a small creek with a pagoda on its east bank, and what appeared to be a fort on its west bank.

*General charts 2661a, 1263.*

*Charts 2734, 2562. Var. nil.*

Off Ku lo wa, on the western bank of the river, there is a considerable ledge of rocks above water; and  $2\frac{1}{2}$  miles above Ku lo wa, on the same side of the river, is Sam chau town, behind a seven-storied pagoda on a low hill near it; there is also a pagoda, in ruins, on low land at about  $1\frac{1}{2}$  miles above Ku lo wa, but on the opposite bank.

**Rattler channel.**—From abreast the seven-storied pagoda at Sam chau, the best channel is Rattler channel, eastward of Rattler islet, which has a depth of 9 to 10 feet at low river (1910). Rattler islet is situated near the middle of a sandbank 2 miles in length, only a small portion of which is uncovered at high river. Using this channel, after giving a berth to Tit ngao point, steer between the south end of the islet sandbank and the bank fronting the shore northward of the point. Keep close to the islet bank until the depths decrease, when cross to the eastern shore, keeping it until near Taiping hii, thence in mid-channel. There is a channel on each side of Taiping chau, that to the westward is not recommended, being narrow and shallow at each end; the eastern is navigable, and has a depth of 5 feet; a rock, with 2 feet water at low river, lies 300 feet off the eastern bank, nearly abreast the northern end of Taiping chau.

Abreast the northern end of Taiping chau, and on the western side of the river, is a black pagoda of three stories, with white bands. At nearly 2 miles above this pagoda is a rock, awash at low water, a short distance off-shore.

At nearly 4 miles above the three-storied pagoda, abreast Rocky point, the width of the channel is considerably reduced by rocky ledges on both shores, and there is a ledge extending from the western shore at 6 cables above the pagoda abreast Rocky point. For others, see the amended chart.

From abreast Rocky point to Samshui junction keep in mid-channel, passing eastward of Sik lung tsi or Campbell island (*Lat.  $23^{\circ} 2' N.$ , Long.  $112^{\circ} 51' E.$* ), which is about 40 feet high, rocky, and situated 6 miles above the three-storied pagoda. Mar dau or Pak nai village is about one mile below Sik lung tsi, on the eastern bank, and there is a seven-storied pagoda on the western bank, just below Sik lung tsi. Westward of Sik lung tsi is a creek with a rocky patch, probably covered at high water, off its entrance. At 3 miles above Sik lung tsi, on the western bank, is Cum le pagoda, which is situated in a village surrounded by trees, and not easily seen from a vessel entering till past it; at 6 miles above the island is Samshui reach, the junction of the Si kiang and Pe kiang, and also the Fat shan branch to Canton river. See page 413.

*Chart 2734, Sam chau to Chau sun*

**Samshui to Shau king.**—Just above the entrance to Samshui reach (*Lat.  $23^{\circ} 7' N.$ , Long.  $112^{\circ} 52' E.$* ) the river is divided by Fort island (Kwang sai), which is flat. For the north-eastern channel, pass the southern end of Fort island in mid-channel, then follow the eastern

*General charts 2661a, 1263.*

*Chart 2734, Sam chau to Chau sun. Var. nil.*

shore at the distance of about one cable. At the northern end of this channel there are two rocks off the red cliffs, and close in-shore. Depths of 5 to 7 fathoms were found in this channel, and the pilots prefer it to the south-western and wider channel.

New reach, the channel south-westward of Kwang sai has depths of  $3\frac{1}{2}$  to 7 fathoms, a little to the mainland side of the centre of the channel, giving a berth to the rocks eastward of the Red banks.

**Ching ki creek** connects West river with Bamboo river, a branch of Pe kiang; it is entered at Ching ki hii, immediately above Fort or Kwang sai island. H.M.S. *Sandpiper*, in July, 1909, when neither Bamboo river nor West river were particularly high, ascended this creek without difficulty to Au ti, a distance of about 6 miles, but above that village, to the junction with Bamboo river, a further distance of about 6 miles, the creek can only be navigated during summer freshets.

Between Ching ki hii and Au ti the creek flows through flat country, and is embanked to prevent floods; the width varies from 60 to 100 yards, and the channel is obstructed by many sandbanks; a depth of 3 feet was found off Au ti. Ta sha is a large village on the right bank, about one mile below Au ti.

**Channel.**—Above the mouth of the Ching ki creek keep along the northern shore of Kwangli reach till abreast Wing on village, then get into mid-channel. Pass close along the south shore of Kwangli island until nearing the west end, when steer for a wooded point on the south bank of the river below Tau kai.

If proceeding by Kwangli bend, keep near the north shore of Kwangli island, and after passing Kwangli town keep on the north side of the river.

Long spits extend from the east and west extremities of Kwangli island.

**First bar** (*Lat.  $23^{\circ} 8' N.$ , Long.  $112^{\circ} 37' E.$* ).—Above Kwangli island, and where the river is broad abreast Tau kai town, is the First bar; there is 6 feet of water here at low river. (*Robin*, February, 1903.)

**Ling yang gorge.**—Four miles above Kwangli is the entrance of Great pass (Ling yang), the river flowing amongst mountain ranges, which rise to the height of 2,814 feet in Mount Parkes. This pass is  $3\frac{1}{2}$  miles in length and nearly straight, and in its narrowest part from 200 to 300 yards wide; the greatest depth in the pass is 30 fathoms at its north-eastern end.

When abreast the pagoda at the south-western end of this gorge, keep over towards the eastern side of the river to avoid a shoal extending a considerable distance from the western shore.

**Shau king** (*Lat.  $23^{\circ} 1' N.$ , Long.  $112^{\circ} 28' E.$* ), a large walled town and a military station, with an extensive suburb lying westward of it, stands on the left bank of the river, surrounded by hills and

*General charts 2661a, 1263.*

*Chart 2734, Sam chau to Chau sun. Var. nil.*

waterways, at 26 miles above Sam shui junction, and 5 miles above Great pass. Provisions are scarce, and no meat can be obtained. It is connected by telegraph. The population is about 20,000. It exports straw mats and bags; carved steatite ware is a local industry.

The river here is over a mile wide, with a least depth of 4 fathoms along the northern or town side, but a sandbank, awash at low river, over  $2\frac{1}{2}$  miles in length, encumbers the southern portion; it is said to be extending northward at its eastern part.

There is good anchorage off the south gates of the city, at about half a mile above the main steps.

The water is said to rise when in flood about 40 feet above winter level, and to reach the roofs of the houses on the bank, and even the town gates.

The tidal influence was felt at Shau king, there being a rise and fall of 3 feet or more in February, but the stream, though completely checked by the flood, does not turn.

**Shau king to Wu chau fu.**—For about 22 miles above Shau king the river winds through a hilly country, opening out again near Narrow island, which appears in the centre of the river covered with bamboos, but is joined by sandbanks to the left bank. The sands off this island are said to have increased; it is therefore advisable to keep over near Tree head on the right or south bank; the channel is difficult with dangers on both sides, as charted. The hills, varying from 100 to 1,500 feet in height, are in general densely wooded, and many of them are highly cultivated. Occasional rugged hills of marble are seen, one of which, of most picturesque form, crops out on the left bank of the river at 32 miles above Shau king, and is called Kai kwan shek, or the Cock's comb, which it strikingly resembles (*Lat.*  $23^{\circ} 7' N.$ , *Long.*  $112^{\circ} 0' E.$ ). There is also a marble range inland 2 miles northward of Shau king, named the Seven stars, after the constellation of the Great bear.

Luk pu, 16 miles above Shau king, and Yuet sing, 12 miles further up, are open to trade.

From Kai kwan shek, by an easy navigation of 16 miles, the walled city Tak hing is reached.

*Plan of Tak hing on 1519, and chart 2735.*

**Tak hing** (*Lat.*  $23^{\circ} 7' N.$ , *Long.*  $111^{\circ} 48' E.$ ) is a town of about 6,000 inhabitants, on the northern bank of the river. It exports a little cheap matting, and has telegraphic communication. Provisions are scarce, and no meat can be obtained. The river here is about half a mile wide, but a bank extends off the town to about mid-channel; southward of the bank there is a depth of 5 fathoms. There

*General charts 2661a, 1263.*



*Chart 2735, Chau sun to Wu chau fu. Var. 0° 10' E.*

are several American missionaries in this town, and also a hospital; some conspicuous buildings have been erected close to the river eastward of the town, the military station.

**The river**, at about 3 miles above Tak hing, takes a short, sharp twist round Steep point, on the right or south bank, which must be closely and carefully passed to avoid Flat rocks and the chow chow water, which may turn a vessel's head against the helm. Flat rocks lie off the north bank a little above Steep point, and are said to be pinnacles, awash at low river.

In Fa piu reach, 4 miles above, there are two rocks in mid-stream, about a cable apart; and immediately under Sheong ti temple, on the south bank, 2 miles above, are three rocky heads, 80 feet from the bank, which uncover 7 feet at low river.

**Monk's head.**—At about 10 miles above Tak hing, and on the left or north bank of the river, a single mass of granite, in the form of a thumb, rises perpendicularly some 300 feet out of a range of hills 1,410 feet in height. Its local name is Kum kwo shek, but it is also called Fa piu, or the Monk's head, and it is most remarkable. After passing this, navigation becomes dangerous, as the river bed is studded with rocks.

**Fa piu rocks** (Kum pei) lie in mid-river, entrance to Tuching (Do sing) reach, south-westward of the mountain of the same name, and to clear them keep the right or south bank aboard.

At the first bend above this, Fairies bridge reef (Sun sin kin) is charted as extending two-thirds across the river from the point on the left bank which lies opposite Tuch Do sing (Tu sing) village, and rocks are charted northward of it; the extreme of the spit is marked by a red buoy during low river, as mentioned below.

**Do sing** (*Lat. 23° 14' N., Long. 111° 34' E.*) is a large modern town with a population of about 20,000; it is the centre of a considerable trade in rice, ground-nut oil, and cake; it was opened to commerce in 1903.

**Do sing to Wu chau.—Buoyage.**—From Do sing to Wu chau, a distance of about 27 miles, the river has been buoyed and beacons placed by the Customs authorities. Some 16 buoys indicate during the low river season all the most dangerous rocks and shoals that obstruct the approach to Wu chau.

The buoys are generally placed in position when the river gauge at Wu chau shows 15 feet after the high river season (October), and are removed when the river has risen again to that level.

*General charts 2661a, 1263.*

*Chart 2735, Chau sun to Wu chau fu. Var. 0° 10' E.*

Red triangular buoys, surmounted by a red wicker cage, mark the starboard hand, and black spar buoys, with black cage, the port side of the channel when going up river. The first red buoy is on the end of Fairies bridge, abreast Do sing; the first black spar buoys are off Do sing and Pa chung bank, as charted.

When the river is high the passage is difficult to make.

**Channel.—Second bar.**—After passing Fairies bridge, keep on the left or Pa chung bank to Tu lok heu, 3 miles above, to clear Pa chung bank and Tu lok spit, then steer for the joss-house just below Szi pi, westward of the rocks situated northward of Tu lok heu, in a least depth of  $1\frac{1}{4}$  fathoms, and when abreast of Chiong kong keep on the right bank until near Second bar, which cross in mid-stream. The least water at lowest river over Second bar and past Janus and Webster rocks is said to be 6 feet; the channel is reported to shift. See River level, page 396.

Bullock rock is not noticeable, but Kopi joss-house, north-west of it, which has bamboos in front of it, is a good mark for Second bar.

**Leading mark.**—Fa piu (or the Monk's head, 1,410 feet high), in line with the hollow between two hills, astern, bearing  $151^\circ$  true, is said to lead in the best water across Second bar and between the Kok heu banks on the left bank, and Robinson, Janus, and Webster rocks on the other, in  $2\frac{1}{4}$  fathoms.

**Fong chuen** (*Lat.  $23^\circ 24' N.$ , Long.  $111^\circ 31' E.$* ).—When past the rock above Webster rocks, keep towards the right bank, past the small walled city Fong chuen (about 28 miles above Tak hing), 2 miles above which Kai river or Ho yune, a tributary, falls into the river; at the entrance of the Kai is a military station.

(In July, 1903, H.M.S. *Sandpiper* proceeded about 32 miles up the Ho yune, without difficulty.)

**Channels.**—From about half a mile above Fong chuen keep on that shore until about a mile above Kai river entrance, then pass close under the bamboo plantation on the right or south bank to clear the Twin rocks (Sheong yu) in mid-stream, which are sometimes submerged, when their positions may be marked by ripples; keep close round the point and under the High bank.

The rocks between High bank and Wu chau fu are marked in low river season, as stated on page 394; apparently there are nine of them, as charted; the third above High bank is the Kwang tung, on the northern side of the fairway.

Kilong islet, with joss-house, is on the south side of the fairway, about  $1\frac{1}{2}$  miles below Wu chau fu.

*General charts 2661a, 1263.*

*Sketch plan of Wu chau fu on 1519. Var. 0° 10' E.*

**WU CHAU FU** (Lat.  $23^{\circ} 29' N.$ , Long.  $111^{\circ} 20' E.$ ), a treaty port, and the frontier city of Kuangsi, is 75 miles above Shau king, about 180 miles from the sea, and stands on the left bank of the Si kiang at its confluence with the Fu ho (Kweiling river). Wu chau is an old city (592 A.D.), and is surrounded by a high brick wall  $1\frac{1}{2}$  miles in circumference, enclosing the south-western side of a low hill. The upper part of the hill is not built on, except for the magazine, a conspicuous building on the north-east part; the lower part consists of mean streets and official residences. The business quarter lies between the city wall and the left banks of the Si kiang and Kweiling. The British Consulate is situated on a hill on the west bank of the Kweiling river, and the antimony works is a conspicuous brick building one mile westward of it.

The population of the city and suburbs is 65,000.

In winter, the Si kiang, opposite the city, has a breadth of 800 to 900 yards, while in summer, when it overflows its sloping left bank (on the right bank is a range of sparsely-wooded hills 400 to 500 feet high), it has a breadth of about three-quarters of a mile.

**River level.**—The rise of the Si kiang, or West river, is irregular. In 1897 the lowest water was taken as a datum for the zero mark at Wu chau fu, since that time the river has fallen 2 feet 10 inches below the zero and risen 68 feet above it, so at the time of low river vessels drawing over 7 feet run the risk of grounding in several places in the river. See diagram showing rise and fall, June to December of 1897, abreast.

The period of low river appears to last from the beginning of December to the middle of March, after which the river rises rapidly, attaining its highest level in June, and falls again gradually from the end of September. In February, 1903, the river rose 22 feet in 24 hours without warning.

In 1904 the first rise occurred about 24th May, and the second about 20th June; the water level was 28 feet above the zero at Wu chau, on 25th May.

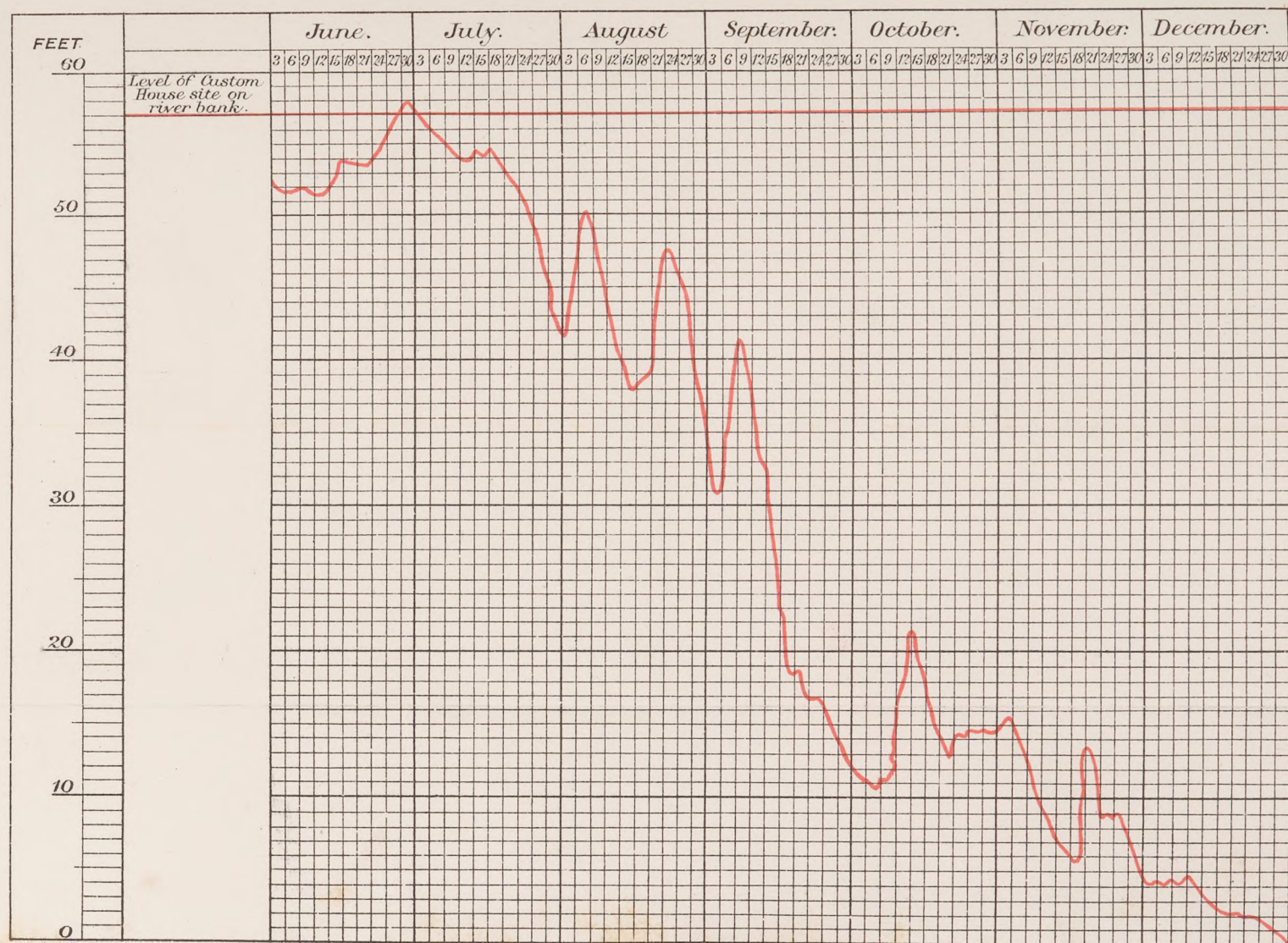
On 1st August, 1906, the river level was only 13 feet above zero, but by 17th August it had risen to 42 feet above.

Wu chau fu can be reached by vessels drawing 13 feet at high river, and 6 to 7 feet at low river. A gauge placed on the right bank of the river indicates the zero and the depth of water exceeding 9 feet on Second bar, 20 miles below the port.

**Tides and current.**—Springs rise 12 to 18 inches at Wu chau. The rate of the stream during high floods in the gorges is 5 to 8 knots, with bad swirls; the average rate in winter is  $1\frac{1}{4}$  knots.

*General charts 2661a, 1263.*

# DIAGRAM SHOWING THE RISE AND FALL OF THE SI-KIANG OR WEST RIVER AT WUCHAU, FOR JUNE-DECEMBER 1897.





*Sketch plan of Wu chau fu on 1519. Var. 0° 10' E.*

**Supplies.**—Provisions are generally plentiful except meat. Coal of an inferior quality can usually be obtained.

**Communication.**—A daily steam service is maintained between Wu chau and Hong Kong; there is also frequent service with Canton.

One or more stern wheelers, of about 350 tons, and 4 feet draught, carrying about 200 tons of cargo, with native passenger accommodation, ply on this route.

Steam launches ply on the upper reaches of the West river as far as Long chau (page 409) in the extreme west, on the Tsu kiang, a branch of the Yu kiang, joining it above Nan ning fu; also to Posé, on the Yunnan frontier; and Liau chau, in the north. A British launch made several trips to Posé during the year 1910, and one to Long chau.

The Wu chau-Nan ning fleet of motor boats number seven, and one owned by the Chinese company was added in 1910. The river is patrolled by Chinese gunboats.

**River distances.**—The distances above Wu chau fu are approximately as follows (Wu chau fu being about 180 miles from the entrance to West river): Teng hsien, 30 miles; Meng kiang hui, 44 miles; Pak ma, 56 miles; Ping nan, 74 miles; Ta huang, 90 miles; Hsun chau fu, 106 miles; Kwei hsien, 167 miles; Great rapid, 200 miles; Wang chau, 230 miles; Nan hiang hui, 243 miles; Yung hsun hien, 277 miles; Nan ning fu, 345 miles; Sin ning chau, 400 miles; Tai ping fu, 475 miles; Long chau, 550 miles; Posé, 570 miles.

**Telegraph.**—Wu chau fu is connected with the principal towns up and down the river by telegraph.

The Chinese postal system extends to Nan ning fu, Posé, &c.

**Trade.**—In 1911 the value of the trade passing the native Customs at Wu chau fu, amounted to 10,657,662 Hk. taels; the trade is expanding on satisfactory lines.

The exports go to Canton, Sam sui, Fat shan, and other towns in the delta, and include bamboo, firewood, indigo, paper, rice, raw silk, planks, cassia, fire crackers, various oils, &c. The tin mines west of Wu chau are doing well.

The imports include salt, which is a Government monopoly, to the value of £103,000.

**Shipping.**—1,203 steam vessels, of the aggregate tonnage of 278,646 tons entered, and 536 sailing vessels, of 23,014 tons; 563 of the steam vessels, and 11 sailing vessels, were British; 458 sailing vessels were Chinese.

Under inland navigation rules 1,574 Chinese vessels entered, having a total tonnage of 32,474 tons.

*General charts 2661a, 1263.*



*Sketch plan of Wu chau fu on 1519. Var. 0° 10' E.*

Goods from Hong Kong and Canton are conveyed in steamers and junks by independent routes to Wu chau, either through the Si kiang entrance or by the various channels leading into it from Canton river.

**Fu ho, or Kweiling ho**, on the west side of Wu chau fu, is navigable by junks as far as Kweiling, the capital of Kwangsi province, and by boats of light draught as far as the Yangtse, for the Fu ho and the Siang of Hunan province are connected by a canal north-eastward of Kweiling. In June, 1903, the river was ascended by H.M.S. *Sandpiper* for 55 miles, when a 10-knots stream was met; three rapids were passed.

*Chart 1015, Si kiang, above Wu chau fu, section A. Var. 1° E.*

**WU CHAU FU to NAN NING FU.**—From Wu chau fu the channel is southward of Cheang cha; there is a channel northward of Cheang cha at high river only.

For the first 14 miles to Yong chu tan sin, a Banyan village on the left bank, the river flows between two ranges of hills, the bases of which sometimes reach the water's edge, and sometimes recede, leaving open spaces, where farmhouses or small villages stand in the midst of cultivated patches, planted for the greater part with mulberry. In a few places small clearings have been made upon the hill slopes, but the hills are usually either bare or overgrown with shrubs and small trees. Clumps of splendid bamboos grow along the river banks.

At the village named, the river winds between fine cliffs about 1,000 feet high, on the summits of those on the right bank is a conspicuous five-storied pagoda. The Yan cha tan, or Oil press rapid, is charted just above the village.

**Teng hsien** (Tung huen) (*Lat. 23° 19' N., Long. 110° 55' E.*), 27 miles above Wu chau, is a large village, with about 5,000 inhabitants, situated on the right bank at the junction of the Yong (Yuen) river. It lies in a space of more open country, and has well-built houses and a set of stone steps leading down to the river.

Teng (Tang) chau, a wooded island 250 feet high at its western end, is situated about 2½ miles above Teng hsien.

For 30 miles above Teng hsien, the river trends through a narrow valley, the hills never attaining much above 400 feet, until just beyond Pak ma, when a bold chain trends north-westward, curving round and reaching the river again at Ta huang.

**Meng kiang hui**, 41 miles above Wu chau, is a large village on the left bank at the junction of the Yong ngan; **Pai ma** (Pak ma), a Likin station, 11 miles further up, is a small village, and the outlet for the cassia produced in the district. Above Pai ma the land opens

*General charts 2661a, 1263.*

*Chart 1015, Si kiang, above Wu chau fu, section A. Var. 1° E.*

out into a wide stretch of undulating country. Maize and mulberry are the principal crops. Considerable quantities of silk are produced in the neighbourhood. Villages are larger and more numerous, but a good part of the land is apparently too poor to be worth cultivating.

**RAPIDS.**—**Kau wei yau tan**, or Dogs' tail rapid, about 5 miles above Meng kiang hui and abreast Huang tuo chau, is about a mile long, with a current running about 8 knots and very strong swirls when the water level at Wu chau was 28 feet above zero; the channel passes between rocks only a few yards apart. This rapid improves with a rise of the river.

In May, 1909, with the water level at 25 feet on the gauge at Wu chau, H.M.S. *Sandpiper* avoided this rapid by proceeding between Huang tuo chau and the small island to the southward.

**Ta kio miao**, or Great tusk rapid, is about a mile below Pak ma (Pai ma); the current and eddies are very strong here at high river, but there are none with the water level at 28 feet above zero at Wu chau.

**Mo lam**, with a conspicuous white joss-house, is situated on the right bank, just above Shallow rapid; above this village the country is more level, and navigation less intricate.

**Tan chu**, 2 miles above Serpent rapid, is situated on the left bank, and has a large brick and earthenware factory.

**Ping nan** is a walled prefectured city, about 74 miles above Wu chau. Population about 5,000; on market days, two or three times a week, there may be 10,000 people in the city, most of whom come in from the country round, but the actual population of the place is very much less. Hides are the chief export, whilst rice and cotton piece-goods are the chief imports.

**Navigation.—Rapids.**—From Wu chau to Ping nan the navigation of the river is extremely intricate. Most of the rocks in or near the channel are marked with cairns, some standing well out of the water, some awash, and others submerged, with dangerous swirls and eddies over them. Most of the rapids give but little trouble, with the exception of Kau wei yau tan. There is light traffic on this section of the river compared with that below Wu chau.

**River.**—Above Ping nan the river traverses a broad plain bounded on the north-westward by the range of hills above mentioned.

**Ku yong tan rapid**, about 5 miles above Ping nan, is only a quarter of a mile long; the whirls and eddies in it are very strong, and the current had a rate of about 9 knots when the water was 28 feet above zero at Wu chau. This rapid improves on the rise of the river.

*General charts 2661a, 1263.*



*Chart 1015, Si kiang, above Wu chau fu, section A. Var. 1° E.*

**Kong hau fu (Ta huang)** (*Lat. 23° 30' N., Long. 110° 3' E.*) is a large and important town at the junction, and on the left banks of the Si kiang and Ta huang kiang, 90 miles above Wu chau, and is the port of Hsan chau fu, 16 miles above it.

The Ta huang kiang is connected with Liau chau river, by a tortuous passage, much frequented by small craft.

There is daily steam communication with Wu chau.

**Anchorage.**—The best anchorage is southward of the entrance to the Ta huang, the bottom being of mud, free from rocks.

**YU KIANG or NAN NING RIVER.**—Above Hong hau fu (Ta huang), above mentioned, the Si kiang or West river is known as the Yu kiang or Nan ning river.

**Tong ku tan**, or Brazen drum rapid, is just below the junction of the Yu kiang river and Liau chau river; there are many rocks in it and strong whirls and eddies, but it improves with a rise of the river.

The navigation of this rapid is said not to be so intricate as those previously mentioned, but in August, 1906, H.M.S. *Moorhen* found the current in it to be running about 10 knots, which was the greatest velocity experienced anywhere between Wu chau and Kwei hsien.

Just above this rapid the change in colour from the dark brown water of the West river to the clear blue of the Nan ning river is very marked.

Approaching Hsun chau fu, the rush of water out of the mouth of the Liau chau must be guarded against.

**Wu kiang or Liau chau river**, *see* page 411.

**Hsun chau fu** (*Lat. 23° 15' N., Long. 109° 56' E.*), 16 miles above Ta huang, is beautifully situated at the junction of the Wu kiang, or Liau chau river, the northern branch of the Si kiang, with the Yu kiang, or south branch. It lies at the south-western end of a range of bare hills, 2,000 feet high. The height of water in the Yu kiang depends to a great extent upon the supply from the Liau chau branch, as a great flood from the latter has the effect of checking the exit of water from the former.

Hsun chau fu is a prosperous city, with 30,000 to 40,000 inhabitants, where many wealthy firms of merchants are established. It is a centre for the timber trade, and a collecting place for the silk produced in the prefecture.

**Yu kiang.**—Between Hsun chau fu and Kwei hsien this river is from 350 to 150 yards wide; it flows across a large plain between high banks, which at the level of ordinary river are about 40 feet high; the shores are in many places rocky.

*General charts 2661a, 1263.*

*Chart 1015, Si kiang, above Wu chau fu, section A. Var. 1° E.*

Mountains are visible over the banks in some parts, and after passing the village of Fuk shan (? Fu chan tsuen, 10 miles above Hsun chau fu) a remarkable rock, rising steeply to a height of about 2,000 feet, is visible to the south-eastward at a distance of about 5 miles.

The country above Hsun chau is desolate, and consists of rolling downs covered with long grass and pines. The villages are few and small. Some sugar is grown, and many ponies are reared.

**Ma pu tan**, a rapid about 2 miles above Hsun chau fu, sometimes has a bad swirl in it between a point and a reef of rocks; this rapid improves with a rise of the river.

*Chart 1015, section B.*

**KWEI HSIEN** (*Lat. 22° 54' N., Long. 109° 31' E.*) is a district city of some 30,000 inhabitants, situated at the foot of a range of mountains, which extends northwards in a great curve. It appears from the river a pretty and most prosperous little city, with some fine buildings. The majority of the inhabitants live outside the city in the eastern suburb, where all business is transacted. The southern part of the city contains one principal street, running parallel to the south wall; the northern part consists of small cottages surrounded by gardens and fruit trees. Two of the principal articles of trade are groundnut oil, and a manure made from the refuse of the nuts after pressing.

**At low river**, Kwei hsien, about 350 miles from the sea, is the limit of navigation except for small motor boats.

Good anchorage is found off the south bank, opposite the main steps.

**Telegraph.**—There is a telegraph station at Kwei hsien; the telegraph wire follows the left bank of the river from Wu chau. There are two schools, and also a French mission in the city.

About a mile above Kwei hsien the telegraph line to Pak hoi is carried over the river on high poles.

Silver mines exist at Sam cha san, about 15 miles northward of Kwei hsien; they have not been worked for some time, but are said to be rich.

**River.**—From Kwei hsien to Nga tong siu, a small village on the south bank at a distance of 16 miles, the river continues to pass between high banks, but above that village it flows through a valley having low hills on the northern side and hills about 1,500 feet high at about one mile inland on the southern side.

Miao men tan and Goa tan (the latter not charted under this name) are rapids situated 4 and 10 miles, respectively, above Kwei hsien, both of which at low river can only be passed by boats.

*General charts 2661a, 1263.*

*Chart 1015, section B. Var. about 1° E.*

Ta ki tan, another rapid, is situated 2 miles above Nga tong siu rapid (Ta yin tan), and above this the river enters a narrow gorge, having a depth of 3 feet at low river.

**Hiang kiang hui** is a small village on the right bank 4 miles above Ta ki tan rapid, having a conspicuous temple.

**Tai po tan.**—This rapid, about half a mile long, not charted, is entered at about 2 miles above Hiang kiang hui.

**Lei kung hsu** (*Lat. 22° 40' N., Long. 109° 26' E.*) is a village 30 miles above Kwei hsien.

**Great rapid**, or Kiang kiun tan (Great rapid of the general who quells the waves), about half a mile above Lei kung hsu, is apparently about  $2\frac{1}{2}$  miles in length; it is really a series of rapids caused by rocky barriers in the river, where it passes through a gorge. There are three rapids; the first, straight, but with a strong current and heavy swirls; the second, the worst, has a very narrow channel, about 80 feet wide between the rocks, with a nearly eight-point turn, and the water rushing down in whirlpools with huge eddies; the third is not so bad, but the channel bends towards the right bank, and passes between rocks, which makes it awkward, the current being very strong.

On the bank just above the second rapid, known as Ni pi tan (Mud wall rapid), (Kan lo tan), where the channel curls into a corner on the northern side, is a fine temple in a grove of firs, used by the pilots and junkmen to pray in for a safe crossing. Beyond the range forming the gorge is a wide open plain, with mountains in the distance, the plain being cultivated principally with maize.

The third is apparently the Tu pu tan, and the upper end of it the Ku tu tan, some 20 miles below Wang chau; the chart is most confusing.

Another and later account is as follows (a variation in the time of the visits will account for any apparent differences, but hardly so with names):—

**Great rapid** (Fu po ti tan).—Good anchorage is found in mid-channel at the foot of this rapid if waiting for the water to rise in order to ascend; it is necessary to have a reading of 15 feet on the river gauge at Nan ning before descending Great rapid, but the ascent can be made with 6 feet less water.

The channel for the first 2 miles is close along the left bank till abreast the upper end of Tsing chao chau island; it then turns off this bank for  $1\frac{1}{2}$  cables and passes between two rocks about 40 feet apart, through strong whirls and eddies, when it makes a sharp turn towards the left bank, and crosses a second rapid close to it. Thence the

*General charts 2661a, 1263.*

*Chart 1015, section B. Var. about 1° E.*

channel is in mid-stream, and crosses a third rapid on a course rather towards the right bank.

Great rapid improves with a rise of the river, but is always dangerous, and a great obstacle to navigation. At 5 miles above the Great rapid a remarkable cave in the marble rock on the west bank is passed.

**Wang (Heng) chau** (*Lat. 22° 32' N., Long. 109° 11' E.*) is situated picturesquely on the left bank of the river at about 20 miles above the Ku tu tan rapid, above mentioned.

It is a small walled town, on the north bank, with post and telegraph office; telegraph wires to Pak hoi cross the river at  $1\frac{1}{2}$  miles below this town.

Good anchorage is found off the south bank of the river, opposite the main steps of the town.

Above Wang chau the river widens until Long rapid is passed.

**San chau tan (San che li chang tan)**, or **Long rapid**, commences a little above Wang chau, and is  $7\frac{1}{2}$  miles long; the channel is close to the right bank, and it is fairly easy to navigate.

A few miles beyond Heng chau the river flows between two ranges of high hills covered with fine trees, and with much vegetation. At the foot of the hills by the riverside, and on the numerous islands are lines and clusters of bamboos.

**Nan hiang hui** is a riverside village off which junks anchor, situated 14 miles above Wang chau, and 2 miles above San men tan (Three gates rapid). This is the terminus of the old route, partly by land and partly by water between the West river and Pak hoi, and is a Likin station. Goods going from Nan ning to Pak hoi all pass Nan hiang hui, which is practically the nearest point on the river to the sea, from which it is distant 85 miles, as the crow flies.

*Chart 1015, section C.*

**Fei long tsuen**, 13 miles above Nan hiang hui, is a small village situated on a point marking a sharp turn in the river. For 10 miles above it the country on both sides of the river is hilly, and densely wooded in many places, the vegetation reaching to the water. Further up the hills gradually become lower, and in many places are terraced for cultivation, finally sinking into plains.

**Ta uang miao** is about 5 miles below Yung hsun hien; there is a short rapid here, with a very strong current.

**Yung hsun hien** (*Lat. 22° 42' N., Long. 108° 36' E.*) is 21 miles above Fei long tsuen, and here the river takes a right-angled turn and leads towards a range of mountains consisting of two parts, one trend-

*General charts 2661a, 1263.*

*Chart 1015, section C. Var. about 1° E.*

ing north-north-eastward and the other westward, which latter the river follows closely until the hills fall into gently sloping downs. There is good anchorage close to the west bank southward of the town.

**Telegraph.**—Yung hsun hien is connected with the Chinese telegraph system.

**RIVER.**—**Above Yung hsun hien.**—At 8 miles above Yung hsun hien the river becomes very narrow, with rocky banks, flowing between high hills on the northern side and low hills on the south; but few villages are passed, and the country is more uncultivated than below that town.

Ling li hui, 13 miles above Yung hsun hien and Man tau tsuen, 2 miles above it, afford good anchorage.

**Pu miao hui** village is about 30 miles below Nan ning fu, in a sharp bend of the river.

**Ping tang rapid**, about 12 miles below Nan ning fu, has a dangerous rock in mid-channel.

**Choang chong hui**, about 10 miles below Nan ning fu, affords good anchorage.

**Landmark.**—A large padoga is situated on a high hill about 7 miles below Nan ning fu.

**NAN NING FU.**—**Aspect.**—The approach to this city is very pretty, the river running with many windings through an open plain, and the banks, consisting of almost level grassland, leading to groves of splendid bamboos and to picturesque villages shaded by trees.

The first view of Nan ning fu shows a very large and prosperous city; it is situated on the left or north bank of the river, and the southern wall follows the bank closely at the eastern end, but recedes some distance from it at the western. The walled enclosure is small for a prefectural city, and the greater part of the inhabitants live in the suburbs outside. The French cathedral, a red building with two towers, and the City Gates, are conspicuous objects. The population is about 50,000, the foreign settlement being on the southern side of the river.

It was opened as a treaty port on 1st January, 1907, and a branch of the Imperial Maritime Customs established; it is about 350 miles above Wu chau fu, and about 530 miles from the sea.

**Telegraph.**—Nan ning fu is connected with the Chinese telegraph system, and there is a post office; for water communication, *see* Navigability on page 405.

**Anchorage.**—There is good anchorage abreast the foreign settlement.

*General charts 2661a, 1263.*

*Chart 1015, section C. Var. about 1° E.*

**Trade.**—The principal importance of Nan ning fu lies in its position as a centre for the collection and distribution of goods and commerce of the four provinces—Yunnan, Kueichau, Kuangtung, and Kuangsi; it is, unfortunately, liable to inundation at high river. Small quantities of tobacco and star aniseed are produced in the prefecture, but Nan ning is not a great producing centre. The principal articles passing through Nan ning are opium, white sugar, aniseed, artemisia, paper, ox hides, horns and bones, cotton yarn, and kerosene.

In 1911 the net value of the imports and exports amounted to 4,700,517 Hk. taels.

**Shipping.**—In 1911, 231 steam vessels entered, of the aggregate tonnage of 9,617 tons, 157 of which were British, and 74 Chinese; 183 Chinese sailing vessels entered, of 4,417 tons. Under inland navigation rules 58 vessels entered, of 1,938 tons; 45 were British.

**Navigability.**—Above Wu chau fu the Si kiang, with the Yu kiang, is navigated by motor boats and large cargo boats of 2 to 4 feet draught up to Nan ning fu, and by smaller boats to Posé, an important district town, approximately in lat. 24° N., long. 106° E.; the Tso branch, which joins the Yu kiang at about 12 miles westward of Nan ning fu, is navigable by boats to Long chau, page 409.

Steamer navigation presents few difficulties for vessels of light draught as far as Hsun chau fu, at the junction of the two branches of the Si kiang, the Wu kiang and Liau chau fu river together forming the northern branch, and the Yu kiang, or Nan ning river, the southern. Above Hsun chau fu the principal difficulty is the Great rapid; this, however, is constantly taken by heavily-laden cargo boats. For details of this rapid, *see* page 402.

The level of the river at Nan ning fu varies about 24 feet between summer and winter; there are usually three rises of over 15 feet during the summer, but they are irregular and uncertain, occurring generally on the third day after heavy rain. The stream runs with a velocity of about 2 knots at low river, and about 5 knots at high river.

There is no doubt that navigation above Wu chau is dangerous, and is only possible with a thorough knowledge of the river.

From Wu chau to Ta huang the river is much encumbered with rocks, but there are good channels and no bad rapids. At Hsun chau there are many banks of sand and stones, and a current running 8 knots has been experienced here in May, the rate below this being about 4 knots.

Thence the channel continues good to Kwei hsien, which can be reached by launches drawing 5 feet at all times of the year. From Kwei hsien to Nan ning fu there are many difficult places, the worst being the Great rapid, and the river is tortuous at 50 miles, and also at 10 miles below Nan ning. Junks have to lighten to 2½ feet at low river. There is a great difference in the navigability of the river at

*General charts 2661a, 1263.*

*Chart 1015, section C. Var. about 1° E.*

low or at high river (*see* page 396), and a very great difference also in the appearance of the river banks and rapids at these times.

The Great rapid is believed to form an effective bar to anything like regular communication with Nan ning fu.

At a first glance the river above Wu chau appears almost deserted; the banks are high, and the junks deeply laden, and the river is so wide that it is quite possible from one side to overlook boats being tracked up river on the opposite side. The shipping consists almost entirely of large junks making journeys to Hsun chau, Kwei hsien, and Nan ning. These craft are of a practically uniform type, well and strongly built, 75 feet long, 15 feet beam, and some draw from 5 to 6 feet of water. The rudder is 15 to 20 feet long, and the junks are also steered from the bows by means of a large oar, unusual steering power being necessary. The carrying capacity is 40 to 47 tons. On the up-river journey they are hauled by trackers, and sail when the wind is favourable; on the downward journey sweeps are sometimes worked. The average rate of travelling up stream is 20 miles a day; it sometimes reaches 30 miles; the rate down stream is of course much faster.

H.M.S. *Sandpiper*, drawing 2 feet 8 inches, ascended the river to Nan ning fu in June, 1901, leaving Wu chau with 30 feet on the water gauge. Difficulty was experienced in crossing the Great rapid, not so much in the want of a sufficiently deep channel as in making the sharp turns amongst the rocks. Above the rapid the river was not found difficult. The people were found to be quiet and friendly.

H.M.S. *Moorhen*, drawing 3 feet water, ascended the Si kiang from Wu chau to Nan ning fu in May, 1908, the water being 25 feet above zero at Wu chau, or at medium height. There are no leading marks for the channels. The most difficult rapids in ascending the river were Kau wei yau (Dogs' tails), Mo Lam (Shallow), Ko yuen, and Tong ku; the others were not found to be dangerous.

Navigation to Nan ning fu was maintained from April to the beginning of December, 1905, by vessels drawing 4 feet of water; and after that, until the middle of February, 1906, by a motor launch drawing 1½ feet, which, but for an accident to her machinery, would have continued running.

As rapid movements of the helm are necessary when navigating this river, the steering gear should be in good order in every respect.

**Pilots.**—Pilots are necessary; those employed by the *Sandpiper* were very good, their knowledge of the river was excellent, and the information they gave as to the positions of rocks, the depth over them, &c., was correct. Pilots can be obtained through H.M. Consul at Wu chau, or Messrs. Jardine, Matheson, & Co., Wu chau.

The pilotage charge is \$250 and a present of \$50 to take a vessel or 3 feet draught from Wu chau to Nan ning and back, but only \$70 should the vessel be unable to proceed above Kwei hsien.

*General charts 2661a, 1263.*

*Chart 1015, section C. Var. about 1° E.*

Coal can be sent up the river by junk; a plentiful supply of wood is always obtainable.

**YU KIANG.**—Nan ning fu to Posé.—When the reading on the river gauge at Nan ning is 15 feet there is no great difficulty in ascending to Posé, but at dead low river, January, the channels in many places have only depths of 3 feet.

Above Nan ning the river flows through a plain, the right bank for a distance of 10 miles being well wooded, and the left bank more bare.

At 4 miles above Nan ning a bar is crossed by keeping near the right bank, and at 14 miles above that town the channel narrows, passing northward of Kok chau (Tuo' chau), a small wooded island between rocks to the northward and a sandbank extending from the island; a strong current is experienced in this channel.

Between this island and San kiang kau, 10 miles above, there are no dangers, and the adjoining country is high; the telegraph wire crosses the river at Yi li, a small village on the right bank 3 miles above Tuo chau.

At San kiang kau, charted in about lat. 22° 38' N., long 107° 48' E., the river divides, the western branch being known as the Long chau; the northern or main stream is still known as the Yu kiang and also as the Posé river.

The Long chau, or Tso kiang, leading to Long chau, is described on page 409.

*Chart 2661a, China sea.*

From San kiang kau, the Posé river trends in a north-westerly direction between low red hills, the channel passing through a shallow rapid about 3 miles above the junction, where the telegraph wires cross the river.

**Kum ling**, a village on the right bank of the Yu kiang or Posé, is situated 7 miles above the junction with the Tso kiang, and the river for a distance of 10 miles is wide, and presents no difficulty; the wooded banks are generally well cultivated, and there are many villages.

A Foreign Office report (1910) refers to a rapid at Kam ling (Kum ling) as being difficult on account of the tortuous nature of the channel amongst partially submerged rocks; it is possibly one of those below referred to.

A conspicuous five-storeyed pagoda stands on a low hill on the left bank, 3 miles above which Lo lung tsa rapid is formed by a large wooded island in mid-channel.

**Lo lung hui** is a picturesque village with many brick-kilns on the left bank.

*General charts 2661a, 1263.*



*Chart 2661a, China sea. Var. about 1° E.*

**Mo yune kiang**, a large tributary from the northward, joins Posé river at 20 miles above San kiang hui, and at the junction the Posé takes a sharp turn to the westward for 10 miles.

**Nga tung**, where Sheong goi kai tan rapid is passed, and Lung cheong, off which is a rock in mid-channel, are villages passed in ascending to Lung on yuen, at which a pagoda, standing on a hill 3 miles to the south-eastward, is seen; the river here widens, and passing through a range of hills extending in a north-west and south-east direction, presents no difficulty.

**Kum gi kok tan**, a rocky rapid, is situated between the village of Tsin ha kuan and Ah gan; at 8 miles above the latter, and extending for a distance of 10 miles, the river passes through a succession of narrow gorges, with sharp turns, while rocky hills on either side attain a height of from 1,000 to 1,500 feet, and a range of mountains to the northward is nearly 2,500 feet high in places.

**Fo Fa cheung** is a large village on the right bank, at 3 miles below which is a narrow, dangerous passage, where a rocky island divides the channel, the passage being situated westward of the island.

Above Kum gi kok tan the river forms long reaches, with easy curves, to within a few miles of Posé.

**Yung long yuen**, with a population of about 5,000, is the largest town between San kiang kau and Posé; it has a large trade in hides.

Ti tung, Nga pan, and Tung kong are villages between Yung long yuen and Yi hong kiu; at the latter the river is joined by the tributary stream Tin gau kiang, above which the channel is divided at Hong kai la by a large cultivated island, the northern passage being the deeper.

**Yi hong kiu** is a village where there are several brick-kilns and a small range of hills, 1,000 feet high, to the northward; on the south side the hills are of a remarkable red colour.

Above this point to Posé there are several very narrow, intricate passages, the country being undulating, with high hills to the westward, and large aniseed plantations.

**POSÉ.**—This walled city has a population of 15,000, and is situated at the mouth of a large tributary known as the Sze cheng kiang. It is at the head of navigation, other than by small boats, and is a distributing centre. There is a large trade, conducted chiefly by junks. It is probable a motor-boat 60 feet in length can reach Posé with but little risk from April to November or December. See Nan ning fu, page 407.

*General chart 1263.*

*Chart 2661a, China sea. Var. about 1° E.*

Supplies of wood must be ordered in advance. There is a conspicuous pagoda at one mile below the city on the left bank.

**Anchorage** is found on a large bank off the mouth of the Sze cheng kiang; the river at Posé generally rises about 24 hours after heavy rain.

*Chart 1015, sections C and D.*

### **TSO KIANG or LONG CHAU (Lung chau) RIVER.**

—This river connects with the Yu kiang, at San kiang kau (*Lat. about 22° 38' N., Long. 107° 48' E., as charted on 2661a*), which river leads to Posé, and beyond, its source being on the western border of Yun nan province. The Tso kiang leads to Long chau fu, a treaty port on the Kwangsi-Tong King frontier, apparently of but little importance as a trade centre.

**Navigability.**—When the reading on the river gauge at Nan ning fu is 15 feet, navigating to Long chau is not difficult, and that place may be reached in two days from Nan ning fu, a distance of about 205 miles. From Nan ning fu, *see Nan ning fu to Posé, page 407*, as far as San kiang kau, the junction with the Tso kiang.

*Chart 1015, section C.*

**Leung mei hui** (Yang uei hui).—At about 2 miles above the entrance or junction with the Yu kiang, is a large village and important market, below which are many shingle islands covered at high river, and among which the current runs strongly.

**Aspect.**—At 8 miles above Leung mei the river, with rocky wooded banks, narrows and winds between rocky mountains; there are but few villages.

Long tau hui, about 44 miles above Nan ning, and Chuei pien tsuen are small villages on opposite sides of the river (apparently 5 miles apart), and above them perpendicular cliffs rise to a height of nearly 1,000 feet.

**Sin ning chau**, a walled town about 55 miles above Nan ning standing back from the right bank of the river, is not seen when passing; the channel for 4 miles below that town to the village of Chang cha tsuen is tortuous.

*Chart 1015, section D.*

**Tuo lu hui**, a large village, with likin station, is situated on the left bank about 18 miles above Sin ning, or 57 miles below Tai ping, and off it there is good anchorage.

The telegraph wires cross the river at about one mile above this village, and there is a sharp turn of the river at Pao ya tang, a waterfall, about 5 miles above.

*General charts 2661a, 1263.*

*Chart 1015, section D. Var. about 1° E.*

**Wong cheong** (Long uang tsuen), about 7 miles below Tai ping fu, affords good anchorage close to the left bank of the river.

At 5 miles above this village a bar is crossed, and there is a dangerous narrow passage at Kwei long ta, where a five-storeyed pagoda stands on a rocky point projecting into mid-channel.

**Tai ping fu**, a walled city, with about 9,000 inhabitants, is surrounded by the river except on the north side.

**Telegraph.**—There is a telegraph and post office at the city, and a conspicuous white schoolhouse is situated just below it.

Anchorage is found above the gravel bank off the main steps.

**Black water river** (Bo chuei ho), so named from the dark colour of the stream, is a large tributary, with a pagoda marking its entrance, flowing from the northward into Long chau river about 24 miles above Tai ping, the channel between being obstructed by many small islands, sandbanks, and rapids. Niau tan (Ox rapid) is about midway.

**Tuo mein hui** is a village on the left bank about 2 miles above Black water river; in this vicinity the banks are covered by groups of bamboos; at Hiang chuei hui, 5 miles farther up, is a fine waterfall.

**San chau tan** (Three islands rapid), about 3 miles above Hiang chuei hui, is a narrow and intricate passage with a strong current; vessels when ascending should leave the wooded island on the port hand.

From San chau tan to Long chau fu the river is narrow and shoal, with many small islets and sandbanks.

**Ming kong**, a large tributary, joins the river from the southward at about 14 miles below Long chau.

**Long chau fu**, charted in lat. 22° 10' N., long. 106° 40' E., a treaty port, is a walled city, with about 12,000 inhabitants, standing on the north bank of the river, and connected with the foreign settlement on the opposite shore by a bridge of boats. There is good communication with Hong Kong via Tong King, the distance to Lang son, from which there is railway communication, being only about 20 miles. A railway is being constructed, or proposed, to Nan ning fu from Lang son. There is communication by courier with Nan ning.

**Trade. — Shipping.** — The value of the imports in 1911 amounted to 154,297 Hk. taels, and the exports to 102,268 Hk. taels. Six hundred and thirty-eight Chinese vessels entered, of the aggregate tonnage of 2,552 tons, and 9 British, under inland navigation rules, of 350 tons.

**Anchorage.—Rise of river.**—There is no good anchorage, but the best is near the bridge. The river rises rapidly; in June, 1908, the level altered 8 feet in 5 hours; a rise generally occurs within 24 hours after heavy rain. About 20th July, 1911, the water was 37 feet above zero. *See page 396.*

*General charts 2861a, 1263.*

*Chart 1015, section D. Var. about 1° E.*

The river gunboats *Moorhen* (British), *Vigilante* (French), and the *Tsingtau* (German), taking advantage of the high river, visited the port.

**WU KIANG, or Liau chau river**, joins the Yu kiang or Nan ning river, the southern branch of the Si kiang or West river, just below Hsien chau fu, or in about lat.  $23^{\circ} 15' N.$ , long.  $109^{\circ} 56' E.$  (*Chart 1015.*)

The following remarks are a summary of the report of the commander of the *Moorhen*, who ascended the Liau chau river in June, 1910; there is no chart published, and the distances are probably only very approximate.

(According to charts 2661a, and 1263, the Lieu kiang (Liau chau) is but the northern branch of the Wu or Hong kiang, the western portion of which is charted as Hong chui kiang, or Red water river, which takes its rise near Mengtz, about lat.  $23\frac{1}{2}^{\circ} N.$ , long.  $104^{\circ} E.$ )

There seems to be no great difficulty in ascending in small craft up to the 142nd mile from the entrance, 13 miles below the city of Liau chau, at all times, but here the river is barred. See the 142nd mile below for details; and means of communication, with the account of the city.

There is anchorage just within its mouth off the north end of Hsun chau suburbs, abreast a small creek.

*Charts 2661a, 1263.*

Miles from  
entrance.

4. No tan rapid, one mile in length, zigzag, current 10 knots.  
Above the rapid is the Mo shan gorge, 3 to 4 miles in length and from 50 to 100 yards in breadth, the banks rising precipitously on both sides and are clothed with jungle.
11. Tai tong gorge, current 6 knots.
- 12 $\frac{1}{2}$ . Pik tan, or Barrier rapid, current 7 to 8 knots.
17. Hung shek rapid.
21. Rapid, village on right bank and spit running out from left bank, river widens considerably.
- 21-30. A series of rapids, and the river much encumbered with rocks and small islands; it is bounded on the north by wooded hills, with a peak, 2,000 feet in height, forming a tongue of land round which the river curves.
23. Guard-boat here (patrol).
30. Village of Lak ma tong, 3,000 inhabitants.
- 30 $\frac{1}{2}$ . Rapid between Sz village and the right bank.
35. Cheung shan chau village.
40. City of Mo shun, capital of district of same name; river above flows between banks 40 feet high, flat country both sides.

*General charts 2661a, 1263.*

*Charts 2661a, 1263. Var. about 1° E.*

Miles from  
entrance.

50. Sharp bend. Guard-boat here. Anchored in 4 fathoms, sand. River had fallen 12 feet, and there was some doubt as to the possibility of reaching Liau chau city.
55. Military station and guard-boat, and then the Lung kau tu, a rapid running 9 knots; from thence a series of small rapids up to 60 miles.
66. Sam kong hau, junction of West and Liau chau rivers (presumably the Ta huang kiang leading into West river). It is full of rapids, 150 yards wide, but deep.
70. Shek lung, market town, military station.
76. Im cheung village, rapid, 6 knots, 8 feet water.
80. Walled city of Cheung chau, the capital of the Department. Ngau kok chau, an islet 30 feet high, with a rapid between it and the right bank, above which is Ku toi tan, a rapid, 6 to 7 knots current.
93. Wan kong hui, a market town, built on an island 50 feet high, at junction of Tsung ping river, on left bank.
103. Kau pin shan, 1,400 feet high, the last 600 feet of which is sheer rock; it was seen from the 20th mile, bearing 20° true.
105. Two islands in river; river very tortuous, a series of short turns following until the city of Liau chau is reached at the 155th mile. Just above these islands the Pak tsai river joins from the north on the left bank, and at the junction is the town of Kong hau, with the village of Pak sha and a guard-boat opposite.
122. Wang la tan, a rapid running 7 knots, and having a right-angled turn, as well as two rocks 40 feet apart, through which a vessel must pass. This rapid, though not so strong as others, is the most difficult, and although, on ascending, the water was only 3 feet above low water level and these rocks were showing, it is not possible to descend until there is sufficient water to pass over them.
131. Yeung hot village, on left bank. At 2 miles above, during heavy rains, a cataract pours over the rocky hills on the right bank close to the village of Kai lak tsun, and presents a fine spectacle. There is a road to Liau chau fu,  $4\frac{1}{2}$  miles as the crow flies, 24 miles by river.
142. River is here shallow, only 4 feet below the wooded islet. A rocky bar above, with two passages; the one in the centre, less than 30 feet wide, has 7 feet water, and is used by the steam launches going up and down. Too narrow for

*General charts 2661a, 1263.*

*Charts 2661a, 1263. Var. about 1° E.*

Miles from  
entrance.

142.

*Moorhen*, which had to take the other, close to right bank, with 4 feet water only when passing up. It is this bar which closes the river to steam traffic in the winter. On the left bank is the market town of Lok kau hui, with a temple on a hill near.

150. Telegraph line from Kwei lam follows the left bank here to Liau chau fu. There is a bar, with 4 feet water, at north end of island, on right bank, abreast Tu po village.

155. **Liau chau fu**, or Ma ping, is a walled city, 1,400 yards by 300 yards in extent, on left bank, with a population of 35,000. There is a mission house near the south gate.

**Communication.**—Four steam launches ran for seven months in the year (1910) between the city and Kong hau (66th mile), whence the Ta huang kiang leads into West river, taking five days to come up and two days down. Junk traffic continues all the year round, uninterrupted.

Both launches and junks are supplied with long ropes for negotiating the rapids, the ropes being taken some distance ahead and the craft hove up by the windlass; 10 or 12 junks arrived per day during the few days' stay of *Moorhen* in June, 1910.

**Telegraph.**—The city is connected with Nan ning fu and other chief places. Postal service by runners to Wu chau, 4 or 5 days' journey.

**Supplies** of beef, pork, sweet potatoes, and fruit are obtainable.

Principal trade is in timber, oil, and ground nuts. The timber and bamboos are floated down in large rafts, with men living on them.

**Missions.**—There is a mission station of the Christian Alliance here, United States citizens.

Business is in the hands of the Cantonese. Chong language is spoken chiefly in the city, Mandarin in the country, and Cantonese on the river banks. The natives were friendly.

*Plan of Samshui reach on 1519; also 2734.*

**SAMSHUI REACH** (Lat.  $23^{\circ} 7' N.$ , Long.  $112^{\circ} 52' E.$ ) connects West river with North river, and with Fat shan branch (page 476) eastward of it through Sai nam reach, to Canton river.

The depth in the reach is reported to change considerably every year after the summer freshets; the plan shows 15 to 17 feet on the bar within Inner point, but at times there has been as little as 6 feet; the deeper water is on the south shore.

*General charts 2661a, 1263.*

*Plan of Samshui reach on 1519; also 2734. Var. about 1° E.*

Pe kiang or North river (page 416) enters on the north side of Samshui reach, on either side of Rattler island.

**Shoals.—Lights.**—A sandbank lies about a cable off the western entrance, from West river; it is marked by a sampan, which carries a red flag by day and a red light at night, but the sampan is withdrawn in squally weather. A short distance off Tweed point, south side of the eastern entrance, is a rock awash, and also one just covered at low water.

The bank extending into the channel between Tweed point and Frazers hill is marked by Kong kun beacon, a white beacon surmounted by a basket; a red fixed light is exhibited from it at night. The channel is northward of it, between it and Rattler island.

A sandbank, which dries 6 feet, extends half-way across the channel westward of Rattler island; its edge is occasionally marked by a sampan, showing a red flag by day and a red light at night. The eastern channel is reported to dry at low river (1905).

There is a rock 11 feet high near the centre of the fairway eastward of the Custom-house at Hokau village north side of the reach. For the remainder, *see* the plan.

**Tidal signal.**—A black ball is hoisted at the Custom-house flag-staff at Hokau when there is a less depth than 8 feet on the bar.

**Tides.**—The tides are uncertain; the greatest rise does not exceed 2 feet; in Samshui reach the current apparently does not cease running out, but slackens at times. *See* page 418.

**River level.**—Floods may be expected once, if not twice, a year, and then only if the Pe kiang and Si kiang are in freshet at the same time. They usually occur in June and July. The highest levels above a zero of 8 feet on the bar were 26 feet in 1897, 14 feet in 1898, and 22 feet in 1899. The river in 1900 was remarkable for the earliness (end of July) and sustained lowness of its fall. The bar showed its maximum, 18 feet 10 inches, in July, and its minimum, 3 feet 7 inches, in December. The freshets are usually accompanied with violent squalls, and the river becomes a sea of wild turbulent waters sweeping past like a mill race.

*See* General remarks on Pe kiang (page 416).

**Anchorage.**—The anchorage for gunboats off the Commissioner's house at Hokau has good holding ground, but is exposed in summer to sudden heavy squalls from the south-eastward; it is obstructed in winter by shifting sandbanks, so that it is closed at that season to vessels drawing over 5 feet. The anchorage outside the bar off Kong kun, where steam vessels anchor during the winter season, can with difficulty accommodate more than three vessels at

*General charts 2562, 2661a.*

*Plan of Samshui reach on 1519; also 2734. Var. about 1° E.*

one time. Both anchorages are liable in summer to sudden freshets from the Pe kiang.

**Directions.**—The plan is unreliable, but the following directions may be some guide. A pilot should be employed unless locally acquainted, but it is only available for small craft. Entering Samshui reach, great attention must be paid to the steering on account of the strong swirls and eddies. Keep close to the northern shore at Mandarin point, and thence in mid-channel until nearly up to Inner point; follow the southern shore to the lower end of the stone wall of Kong kun, keep mid-stream around Tweed point, and along the southern coast of Rattler island, northward of Kong kun beacon, a white basket on a white pole, till nearly up to Low point, then edge to the centre of the channel, and anchor off Hokau or where advisable.

When leaving, and abreast of Mandarin point, the helm should be put hard-a-port, or the ship will be set down on Entrance point.

Numbers of native craft and immense rafts are met with in the entrance; as the rafts are kedged up, their progress is very slow, and impedes navigation.

The large rafts, measuring perhaps 400 feet by 150 feet, which sometimes come down North river three or four at a time, and occupy almost the entire width of the river, as well as large stacks of pine tree branches, measuring 30 feet by 15 feet, which are floated down two abreast on boats lashed together, for burning in lime-kilns and factories, are dangerous to navigation. Sometimes 20 or more of these rafts and stacks are in close proximity to one another, and several collisions occurred during the year 1900.

**SAMSHUI** is a treaty port on the eastern side of the mouth of Pe kiang or North river, the town being situated about three-quarters of a mile inland, with a population (1910) of 6,000; it is a place of considerable trade, but the greater part of the business is said to be carried on at Sainam, about 2 miles eastward of Samshui on the Fat shan branch, which town, however, is not included in the treaty port. Sainam has a telegraph station; its population is 40,000 to 50,000. The actual port of Samshui is Hokau (Hohau), a straggling street extending about one-third of a mile along the river bank; for six months of the year, being outside the embankment, it is more or less flooded.

On the eastern side of Samshui junction is Kong kun, one of the ports of call, and so made because steamers are unable at all seasons to reach the anchorage off Samshui Custom-house, in consequence of the bar between Rattler island and Frazers hill.

*General charts 2562, 2661a.*



*Plan of Samshui reach on 1519; also 2734. Var. about 1° E.*

**Trade.**—The principal articles of native produce are sugar and tea (from the Pe kiang), straw bags, paper, and rice birds; the latter appear to be indigenous to the Samshui district; thousands of them are snared in nets during autumn, tinned in Sainam, and sent to Hong Kong for shipment to the Straits Settlements.

In 1910 the value of foreign trade imports was 4,702,405 Haikwan taels, and that of exports 742,304 taels, the value of the tael being 2s. 8 $\frac{5}{8}$ d. English money. In 1911 it was considerably less.

**Shipping.**—In 1911 the number of steam vessels entered under general regulations was 1,925, with an aggregate tonnage of 537,060 tons, and 154 sailing vessels, of 24,171 tons; 791 steam vessels, and 28 sailing vessels were British. In addition, the inland navigation trade by means of steam launches amounted to 5,691 entries, with a total tonnage of 118,569 tons.

**Telegraph.**—The nearest telegraph station is at Sainam, mentioned on page 415.

**Communication.**—Five trains run daily each way between Canton and Samshui; there is also daily steam communication with Hong Kong.

**Supplies.**—Provisions are not plentiful, and no meat could be obtained. There is any quantity of firewood, which, cut and tied in bundles of about 12lbs. weight, costs about ten dollars a ton. Local coal is unsuitable for steam vessels.

The water at Samshui and above is not good for drinking, but is suitable for water-tube boilers; in summer it is muddy.

*Charts 3218, Pe kiang or North river; also 2734.*

**PE KIANG or NORTH RIVER.**—**General remarks.**—Pe kiang or North river, locally known as Pakkong, rises in the north-eastern corner of Kuangtung province, flows south-westward for about 70 miles as far as Shao chau fu, where it turns southward, and, after a course of about 130 miles through the middle of the province, passes westward and southward of Samshui (page 415) into Sainam creek, at about 1 $\frac{1}{2}$  miles eastward of Samshui junction with the Si kiang. Except at certain times in the spring, when a freshet forces the Pe kiang to run into the Si kiang, these two rivers never really mingle. The rises seldom occur simultaneously; thus, in July, 1904, the Si kiang was in flood, with the water gauge at Wu chau showing 51 feet, whereas the Pe kiang was only 5 feet above its winter level.

Although the Pe kiang can hardly be classed among the large rivers of China, it may claim to be considered an important waterway, having served for many centuries as part of the great trade route between Canton and the cities in the Yangtse valley. The ruins of temples, rest houses, and jetties, met with all along its course, bear

*General charts 2562, 2661a.*

*Chart 3218, Pe kiang or North river. Var. about 1° E.*

witness to the trade which at one time existed, but at the present day, although the junk traffic between Canton and the towns in the Pe kiang basin is still considerable, the only through trade worthy of mention is that in Kiangsi porcelain and Hunan tobacco.

The country of the Pe kiang basin northward as far as Tsing yuen, a distance of 43 miles from Samshui, is flat, fertile, and well populated; the conditions of trade seem to be identical with those prevailing in the Canton delta.

Above Tsing yuen the country is mountainous, and produces little of any value, but there is excellent grazing country, especially near Shao chau fu. The river valley is sparsely populated; its trade is entirely with Canton. Piracy is now almost unknown.

**Navigability.**—Below Ying te, 90 miles from the entrance, the Pe kiang, although shallow in places, presents no exceptional difficulties to small vessels, as navigation is not impeded by rocks and rapids. Steam launches, not drawing over 4 feet water, and under normal conditions of the river, can reach Tsing yuen, 47 miles up, during about seven months of the year, and Ying te during about five months (or from May to September).

From Ying te to Shao chau fu, about 147 miles up, the river narrows considerably, and becomes extremely intricate, with many shallows and rapids. There are few rocks, and these being close to the banks are not dangerous, but the frequently shifting sand and gravel banks cause great difficulty. Navigation in this part of the river, even for native craft, depends entirely on the rainfall; a heavy rainfall causes the river to rise from 12 to 18 inches in 24 hours. April, May, and June are the only months when a vessel of 2½ feet draught could depend on reaching Shao chau.

H.M.S. *Robin*, with 2 feet 6 inches draught, ascended to Shao chau in June, 1901; and again in July, 1904, when the river was 5 feet above winter level at Samshui. Considerable difficulty was experienced above Ying te, the rapids in places being very strong, attaining a velocity of 7 knots. On the return on the 17th July, at about 4 miles below Shao chau fu the river rose 9 feet in 11 hours.

In April, 1905, H.M.S. *Robin* again ascended to Shao chau fu. The river was 8 feet above winter level on leaving Samshui, and the current setting round Rattler island was practically a race. On reaching Wu shih, 124 miles up, the vessel was delayed 8 days, owing to a fall in the river, and another 7 days at Tung kwn chau, 138 miles up, for the same reason. Shao chau fu was reached on the 15th May, the passage having occupied 23 days.

*General charts 2562, 2661a.*

*Chart 3218, Pe kiang or North river. Var. about 1° E.*

**Caution.**—Inconvenience was experienced throughout the river from weeds fouling the screws and choking the condenser inlet. As sandbanks shift, silt up, or disappear, and the channels alter, with every heavy flood, a pilot with local knowledge is indispensable to navigate the Pe kiang.

No rule of the road is observed, and junks pass each other on either side at will; sometimes a man in the bow of a junk will indicate by waving the side he wishes you to go. The plan of whistling first, and then waving to any junk that seemed to be taking an indefinite course, has been successfully carried out. The stone-carrying junks are laden to the water's edge, and are almost unmanageable, generally drifting down broadside to the current.

**Pilots** for the river can usually be obtained at Samshui, but another must be taken at Ying te, 90 miles up, as the banks above that town are constantly on the move.

**Current.**—The former volume (III.) states that the current down the Pe kiang runs from  $2\frac{1}{2}$  to 3 knots an hour, much accelerated during the rainy season. It is divided by Rattler island in the entrance, and sets directly on Tweed point, Samshui reach. For the greater part of the year the current runs from the Pe kiang into West river, but during the height of the rainy season it may be reversed. See River level, page 414.

(The same volume states that between Wang fu kang and Shao chau fu there are 14 places where the river flows at a rate of about 7 knots, over beds of large stones covered by 3 to 4 feet water, the channel at these places being only about 40 feet broad.)

**Description.**—The following description of the river is from the visits of H.M.S. *Robin* and *Sandpiper*, June and July, 1901, 1904, 1905; the depths, &c., apply to the river at those times.

**Bamboo river.**—This stream rises in the north-eastern corner of Kuangsi, and is a principal tributary of the Pe kiang; it flows from the westward, and enters the Pe kiang at about 6 miles above Samshui; H.M. gunboat *Sandpiper*, in July, 1909, when both this river and North river were fairly low, ascended to Szi Wui, a distance of 14 miles.

The channel was narrow and shoal, with many sandbanks, the river having a breadth of from 200 yards to 300 yards; a shifting bar obstructs the entrance, and several bars, with a depth of 3 feet, were crossed. Wang kong is a village on the left bank, about 7 miles within the entrance, the intervening country being flat; above Wang kong the banks are fringed with bamboos, and on the southern side

*General charts 2562, 2661a.*

*Chart 3218, Pe kiang or North river. Var. about 1° E.*

the country is hilly and picturesque. A rock is situated in mid-channel just below Wang kong.

Szi Wui is a walled town, situated on the left bank of the river, and has a population of about 10,000; the channel off the town is narrow, with a depth of from 4 to 5 feet, and is the limit of navigation for ordinary steam launches.

The large market town of Shek kou, at the entrance of the bamboo country, 7 miles above Szi Wui, is the chief centre of trade in the district, and here great rafts are put together, which, dropping down to Fat shan and Canton through the narrow creeks in the delta, form serious impediments to steam navigation in those waters. The towns of the delta derive their supplies of bamboo from this river.

Ching hi creek, connecting Bamboo river with West river, is entered at 9½ miles within the entrance of Bamboo river.

**Lu pu** (Lu pao) is a busy town on the left bank of the Pe kiang at 15 miles above Samshui, and the seat of a likin station. Launches run daily almost throughout the year between Canton and Lu pu, viâ Fat shan and Sainam reach.

**Shih kio** (Shek kok), 16 miles above Lu pu, is a large town on the left bank of the Pe kiang, having considerable shipping; there is a well-preserved pagoda on the opposite bank. The surrounding country is low, and a fine embankment stretches for over 1½ miles below the town.

**Tsing yuen** is a well-built prosperous-looking town, extending 1¼ miles along the right bank of the river at about 11 miles above Shih kio. Its water front is occupied by shipping and boats, and its population is estimated at 3,000. The celebrated Tsing yuen tea is grown on the hills northward of the town; pan (or brown) sugar is the other chief product of the district. The principal industries are the manufacture of flour, and of pea-nut oil; there are extensive fish ponds in the suburbs.

American Baptist and Roman Catholic missionaries have their head-quarters in the town.

The hills in the vicinity of Tsing yuen are fairly rich in timber, and tigers are said to be numerous on their jungle-covered slopes. Here the plain abruptly ends, and the river flows through a mountainous country, practically without interruption, to the borders of Hunan and Kiangsi.

Launches run daily between Canton and Tsing yuen for about seven months in the year.

Between Tsing yuen and Ying te, which is the next town of any importance on the river, the scenery is of the most beautiful descrip-

*General charts 2562, 2661a.*

*Chart 3218, Pe kiang or North river. Var. about 1° E.*

tion, and the country begins to be hilly and well wooded. The river banks are covered with bamboo groves, which are cut annually and rafted down to Canton.

**Fei loi tze gorge** (Fi loy tze) is about 9 miles above Tsing yuen, and 58 miles from the entrance; here the river narrows, and flows through a curved pass between hills rising abruptly some 500 feet. At the entrance to the gorge, and on the right bank, is the salt station of Ta miao or Pai miao (Pak miu), where salt for the Lienchau district is transferred from large Canton junks into smaller craft. The fishing village on the opposite side has an evil reputation for piracy. At about three-quarters of a mile above Ta miao stands the famous Buddhist monastery of Fei loi tze, forming with its halls, shrines, and kiosks, picturesquely placed in the midst of a thickly-wooded ravine, a notable example of Chinese ecclesiastical architecture. There are limestone quarries on either side of the gorge, and these occur at short intervals on both banks of the river for the next 50 miles. A succession of boats deeply laden with limestone passes daily down the river to the lime-kilns of the delta.

The river above the gorge, which is 3 miles long, widens; the hills recede from the bank, becoming higher and more wooded than before.

**Pak kong kiau (kou)** is on the left bank of the river just above the gorge, about 62 miles from the entrance; there is a telegraph station at Kwan chin, 4 miles inland. The railway from Canton to Hankau is intended to meet the Pe kiang near this town.

**Wong shih**, or Wong shek, a small market town, is on the right bank of the river, at  $7\frac{1}{2}$  miles above Pak kong kiau, and about 70 miles from the entrance. Both banks above Wong shih are lined with bamboo groves as far as Ta miu hap (Great Temple pass), where the river again winds between high hills and precipitous cliffs. At about 6 miles above this pass are the Censer gorges, and a little further up is the entrance to Mong si hap gorge; here Lienchau river, flowing from the westward, joins the Pe kiang. At the junction is the busy shipping port of Kong ho (hau).

**Railway.**—Wong shek is connected with Canton by a railway.

*Plan of Lienchau river on plan 3218.*

**Lienchau river**, the second principal tributary of the Pe kiang, 82 miles above the entrance, rises in the north-western corner of Kuangtung province, and flows for about 90 miles through a mountainous country, inhabited by the Miao tze aborigines, who, secure in their inaccessible mountain homes, to a great extent defy all efforts of the Chinese to control them. The principal towns on the

*General charts 2562, 2661a.*

*Plan of Lienchau river on 3218. Var. about 1° E.*

river are Lienchau, situated in a fertile plain, a prefectural city of some 50,000 inhabitants, and the centre of trade in north-western Kuangtung; Yungshan, a district city; Taiwan and Howkong, the latter a large likin station, with a bridge of boats.

Roman Catholic missionaries have for some years past had stations all along the river, and recently American missionaries have established themselves at Lienchau.

Vessels can ascend the Lienchau without difficulty for about 8 miles to the first rapid, the breadth of the river being about 250 yards, and the banks lined with thick bamboos, behind which rise well-wooded hills.

(H.M.S. *Moorhen*, of 2½ feet draught, tried in 1903 to ascend the Lienchau, presumably at high river, but that vessel only got 20 miles up, owing to the tortuousness and narrowness of the channel.)

*Plan 3218, Pe kiang or North river.*

**Mong si hap** (Blind Boy pass), about 3 miles in length, and from 50 to 100 yards broad, is so called from the striking profile of a face, visible from certain directions, on a cliff on the right bank of the Pe kiang. It commences just above Lienchau river; at its north end is a sunken rock which is left to the westward.

**Ta shih leng**, or Lau tai wan, is on the right bank of the Pe kiang, at about 2¼ miles above Mong si hap; here limestone is carried down the sloping banks in wheelbarrows, and discharged into junks.

There is a sandbank in mid-channel, just below Ta shih leng.

**Ying te**, or Ying tak, on the right bank, at 3½ miles further up, and 90 miles from the entrance, is a small walled town, with about 3,000 inhabitants, picturesquely situated in an amphitheatre of rugged hills, just above a range of limestone cliffs, which, jutting out into the river, form one of the numerous "gates" of the Pe kiang. It was formerly the seat of government for this part of the province, and a noted Buddhist centre; it is now a busy shipping port, and the present limit of regular steam navigation on the Pe kiang. A steam launch runs every other day from Canton and Tsing yuen to Ying te from about May to September.

**Telegraph.—Railway.**—Ying te is a much smaller town than Tsing yuen; it has some fair shops in the main street. There is a telegraph station and railway communication with Canton.

The district produces rice, sugar, and bamboo, and a large amount of barley is grown on the river banks between Ying te and Shao chau fu.

**Yung yuen**, or Copper river, joins the Pe kiang opposite Ying te; it is only navigable for small boats which bring down charcoal.

*General charts 2562, 2661a.*

*Plan 3218, Pe Kiang or North river. Var. about 1° E.*

**River.**—The channels between Ying te and Mau yu shek, 3 miles above, are narrow and difficult. The Pe kiang for some miles above Ying te flows between high banks through a fertile country, cultivated with rice and sugar cane.

Wang fu kang village is on the left bank, at 6 miles above Ying te; there is said to be a small lake on the summit of a hill behind it. At 5 miles further up on the right bank is the celebrated Kuan yin shan, a cliff of rock, covered with dense foliage, on the north side of entrance to Sulphur river or creek, rising almost vertically some 600 feet from the river. Here are the cave temples dedicated to the Goddess of Mercy; at the foot of the hill a stone stairway leads into the caverns, which pierce the cliff in all directions.

**Sha hau** is 9 miles above Kuan yin shan; here the Canton salt junks tranship their cargoes into small, flat-bottomed junks during the low-water season, and the small junks proceed past Shao chau into Hunan.

**Wu shih** (Wu shek) is a small town on the left bank of the river at about 10 miles above Sha hau, and 124 miles above the entrance; the country around Wu shih is sparsely populated.

**Tan tze ki** (Cannon Ball barrier), not charted, above Wu shih, is a striking gorge, where the cliffs rise higher than at Kuan yin shan. There is another place called Tan tze ki, situated about 7 miles below Wu shih.

**Tak tu** (Pak to) is a large village on the right bank at 8 miles above Wu shih, and 134 miles above the entrance. In the hills above Tak tu coal can be seen outcropping in many places, but it is not now worked.

**Lung kwei** (Yü yuen) river joins the Pe kiang from the westward just above Tak tu; this river flows through a mountainous country, inhabited by several large aboriginal tribes. The productions of the Lung kwei district are maize, bamboo, and charcoal.

**SHAO CHAU FU** (Shiu kuan), 12 miles above Tak tu, and 147 miles above the entrance, is the principal city in northern Kuan-tung, and is well situated on a peninsula, formed by the junction of Ching kiang with Pe kiang; it is surrounded by a crenellated wall in a good state of preservation, and contains about 80,000 inhabitants. The principal business quarter is the Cantonese suburb outside the wall facing the Pe kiang. The Yamêns are in the native or Hakka quarter, near the West gate, off which there is anchorage; there are also a Hunanese and a Kiangsi quarter. Shao chau fu has no manufacturing, but is a distributing centre for the country around, and an important Customs barrier; bridges of boats, stretched across the

*General charts 2562, 2661a.*

*Plan 3218, Pe kiang or North river. Var. about 1° E.*

rivers just above the junction, facilitate the collection of duties. The Imperial Chinese post has an office in the city, but the inhabitants prefer to use the native courier service, which is cheap and safe.

**Railway.**—Shao chau is in railway communication with Canton, &c. There is also a telegraph station.

**Trade.**—The principal exports are various oils (chiefly ground-nut oil), coal, sugar, and cereals. The minerals existing, besides coal, are iron, silver, copper, lead, plumbago, and asbestos. A good deal of pottery, and also tea and tobacco, comes through from Nam heung. The imports are kerosene, American flour, piece goods, Bombay yarn, lamps, &c. The chief production is paper made from bamboo fibre, and coarse pottery is made in the neighbourhood. Great quantities of firewood are floated down in rafts. Game abounds.

**Coal.**—The coal fields of Hunan extend southward to Shao chau, and there are coal mines situated within 5 miles of that city up both rivers, which have been worked for some years past by native methods. The present output is inconsiderable, and the coal, which is taken from the surface, is of poor quality; it sells in Shao chau for about \$6 a ton. In Kuantung province, generally, supplies of coal are derived from Japan. There is silver in the hills near Shao chau, but it is not worked.

**Missions.**—Three missionary societies are working in this part of the country; the Roman Catholics, with head-quarters at Nam heung, who devote themselves chiefly to work among the country people; the Berlin mission, with stations at Nam heung, Chih sien, Yen fa, and Shao chau; and the Wesleyans, with stations at Shao chau, Locheng, Lung kwei, Mong fu kong, and Ying te.

**Climate.**—The climate of Shao chau is hot in summer, and, owing to the sudden changes in temperature, caused by alternating northerly and southerly winds, is unhealthy for Europeans. The winter is cold, frost and snow being of frequent occurrence.

Plague is unknown; cholera and small pox are common.

**Fauna.**—The surrounding country, besides being extremely picturesque, abounds in wild animals of all kinds, among which deer, wild boar, porcupines, monkeys, leopards, and tigers may be mentioned. The last-named are reported to be numerous; they frequently descend on outlying villages, and carry off dogs, buffalo, and sometimes children. The Siberian wolf is also found near Shao chau fu. Snipe and partridge are fairly plentiful.

*General charts 2562, 2661a.*



*Plan 3218, Pe Kiang or North river. Var. about 1° E.*

**Ching kiang, or Clear river**, which joins the Pe kiang at Shao chau fu, leads to Locheng, and through the Chiling pass into Hunan; it is impeded by rapids, and is navigable only for light-draught junks.

**UPPER RIVER.**—The **Pe kiang**, about Shao chau fu, leads to Nam heung and through the Meiling pass into Kiangsi; it is impeded by rapids, and is navigable only for light-draught junks.

*General charts 2562, 2661a.*

## CHAPTER IX.

CHU KIANG OR CANTON RIVER, AND THE VARIOUS CHANNELS  
CONNECTING THE RIVER WITH THE SI KIANG OR WEST RIVER.

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VARIATION: Nil; westerly increase about 4' annually.

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*Charts 1180, Approaches to Hong Kong; also 3026.*

**General remarks.—Caution.—Off-lying islands.—**

The islands and dangers in the approaches to Hong Kong and Canton cover a space of about 50 miles, between Wung kum or Montanha island on the western side of Great West channel and Basalt and other islands eastward of the island of Hong Kong. Bearings of the islands are all that are necessary for avoiding any of the sunken dangers, but as few of the small islands lying in the approaches have been closely surveyed they should not be approached within one mile.

The Ladrone islands are useful landmarks for vessels approaching from the south-westward (*see* view on page 428); and the light on Gap rock, the south-westernmost of the Kaipong islands, is the object that should be made for at night. The outer groups are the Ladrones, Kaipong islands, and the Lema islands eastward of them; within these are several smaller groups.

Enormous fleets of fishing junks cruise in the approaches to Canton river and Hong Kong; these junks show no lights; as a rule, they carry the smallest square sail forward; they are stoutly built, and serious damage would probably be caused to an iron vessel by a collision with one of them; they are sometimes found 40 miles off-shore. This caution also applies to all the coast of China, but the large trading junks are differently rigged, having five masts with two small sails aft.

**KAIPONG ISLANDS**, the southern and outermost group of the archipelago fronting the Chu kiang or Canton river estuary and Hong Kong approaches, extend north-east and south-west about 10 miles.

**GAP ROCK** (*Lat.* 21° 49' N., *Long.* 113° 56' E.), or Man mi chau, the south-western of the Kaipong islands, is 97 feet high; several rocks extend for the distance of one cable around Gap rock,

*General charts 2212, 2562, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

and patches of 10 fathoms steep-to, lie at 3 cables south and 8 cables northward of the rock. At a mile off, southward and westward, the depths are from 17 to 20 fathoms.

**LIGHT.**—From a white tower on the eastern corner of the keeper's house on Gap rock, 62 feet high from ground to vane, is exhibited, at an elevation of 140 feet above high water, a *revolving white light every thirty seconds*, showing thus:—light, *five seconds*; eclipse, *twenty-five seconds*; which should be seen from a distance of 18 miles in clear weather.

The lighthouse buildings are painted white.

**Fog signal.**—A fog explosive is fired *every ten minutes* in thick weather.

**Signal station.**—There is a signal station, International code, on Gap rock, which is connected with the post office and Harbour Master's office at Hong Kong by a submarine telephone cable; passing vessels are reported.

**Storm signals** are shown here; *see* pages 510-512.

**Buoys** for lighthouse purposes are moored north-eastward and south-eastward of the rock.

**Jubilee islet**, 200 feet high, lies about a mile north-eastward of Gap rock, with Nut islet, 280 feet high, a mile beyond. Reef islet, 90 feet high, lies nearly a mile south-east of Jubilee, with a sunken rock off its south extreme; islets lie north-eastward of the last two, as charted. The channel between Gap rock, and Jubilee islet and Reef islet, is about a mile wide, has depths of 10 to 18 fathoms, and is safely navigable with a steady wind.

**Peaked rock**, 160 feet high, and the easternmost of the cluster, lies  $1\frac{1}{2}$  miles north-eastward of Reef islet.

Others are rocks close off its south side.

**Rugged rock**, 50 feet high, the northernmost, lies 2 miles north-eastward of Nut island.

**Tsi mi wan**, the westernmost of the two large islands of the Kaipong group, separated from the south-western point of Pak tsim by a channel about half a mile wide, is about 2 miles long, north-east and south-west, narrow, of very irregular shape, and 750 feet high.

**Pak tsim** is the north-eastern and largest island of the group; the Ass's Ears, two remarkable peaks near its western end, rise almost perpendicularly 940 feet, and falling suddenly on the north-eastern side, unite to the moderately high land which forms that part of the island.

*General charts 2212, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

**Kwei tau**, or Tortoise head, a white rocky islet, lies about three-quarters of a mile eastward of the eastern point of Pak tsim; there is a rock awash at times, between it and the point, and all the vicinity should be given a wide berth, as it has not been surveyed.

**Gai une**, an islet 130 feet high, is rather over one mile northward of the northern end of Pak tsim; the passage between is unsafe, for some rocks on which the sea sometimes breaks are said to exist in it.

**Cambridge rock** is a pinnacle with  $2\frac{3}{4}$  fathoms water, and on which the sea sometimes breaks, lying  $50^\circ$  true, one mile from Gai une. There are depths of 4 to 5 fathoms on the rocks which surround the pinnacle. Caution is required when navigating in its vicinity.

**Tai ta mi channel**.—Kwei tau, Pak tsim, and Cambridge rock bound the south-western side of Tai ta mi channel, about 3 miles wide, with depths of 18 to 20 fathoms.

**LEMA ISLANDS**, eastward of the Kaipong group, five in number, extend east-north-east and west-south-west nearly 13 miles.

The islands on their southern sides are all steep and rocky, with not even a single bight that a boat could shelter in.

Notwithstanding their barren appearance a few men reside on them, preparing small quantities of charcoal from brushwood found between the rocks, which is sold at Macao. *See view b* on page 428.

**Tai ta mi**, a small but high islet, the south-westernmost of the group, lies on the east side of the channel of same name, above mentioned, southward of Pun tin, with a channel half a mile wide between it and Pun tin.

**Mosquito rock**, 50 feet long, east and west, and 30 feet wide, with a depth of 2 fathoms, lies about 2 cables southward of the southern end of Tai ta mi islet. The south-eastern extremities of Tamkan and Ye chau islands in line lead south-eastward, and Ichau head and hummock well open of the western point of Tai ta mi islet leads westward of it.

**Pun tin island**, 1,210 feet high, northward of Tai ta mi, has a more peaked formation than the others, and Ichau head, its western projecting point, has a hummock on it.

**Ye chau**, the highest and central of the Lema islands, when viewed from most positions, appears flat-topped. Round island, a small rocky islet, lies close to its north-eastern point.

This island is separated from Pun tin by Ye chau channel, about 4 cables wide, with depths of 10 to 30 fathoms, but it is not recommended, and should not be taken by a sailing vessel except from necessity.

*General charts 1962, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

**Tamkan**, the eastern and largest of the Lema islands, is 6 miles long, one mile broad, 852 feet high at its western end, and separated from Ye chau by Yat mun, below mentioned.

Water may be obtained on the northern coast of Tamkan at several places.

**Joss-house bay**.—Close westward of North-east head, in Joss-house bay, is a Chinese place of worship, and about this part the compradores' boats await sailing vessels after the end of August, when easterly winds set in.

Yat mun is clear, and 12 to 19 fathoms deep, but this channel is not recommended, and should not be taken by sailing vessels except from necessity. Round islet lies on the western side of the fairway.

**LADRONE ISLANDS**.—**Great Ladrone**, or **Man shan** (*Lat. 21° 56' N., Long. 113° 44' E.*), is the outermost island directly fronting the Chu kiang or Canton river estuary. This island, with Little Ladrone westward of it, and Potue 6 miles north-westward, bounds the eastern side of Great West channel, leading to the river. *See view a, abreast.*

The north-western part of this steep, bold island forms a round dome, 1,468 feet high, and its appearance differs from all the other islands, although most of them are high. It is about 2 miles in diameter, and rocky.

Pumice Stone bay is a small inlet at its south-western end, where fishing boats shelter in the north-east monsoon.

**Little Ladrone**, or **Poking han**, lying westward of Great Ladrone, and separated by a narrow channel from 9 to 18 fathoms deep, which should not be used except in necessity, is 1,083 feet high, and of convex sloping form; rocks lie close to its south-east extreme.

**Black rock**.—A small rocky islet lies close to the north-eastern point of Little Ladrone, and 7 cables northward of this islet is Black rock, which is covered at high water, with 9 fathoms close around; to clear the rock when it is covered, keep about midway between Little Ladrone and Tong ho island.

**Potue, or Passage island**, about 5 miles north-westward of Little Ladrone, is a sloping rock visible about 9 miles. There are depths of 5 to 6 fathoms around it, but it must not be approached in light winds by a sailing vessel, as the eddies occasioned by the stream out of the river might render her unmanageable and drift her towards it, or Wong mu.

**Wong mu island**, lying  $1\frac{1}{2}$  miles east-north-eastward of Potue, is  $1\frac{3}{10}$  miles long, north and south, with a greatest width of 4 cables,

*General charts 2562, 2212, 2661a and b.*

# Approach to Canton River and Hong Kong.



West River. Great West Channel. Great Ladrone.

Lantau island.  
At chau islands.

Gap rock and Katpong Is.  
(Lighthouse).

Ass's Ears.

Lema Is.

View of the Ladrone and Lema Islands, with Great Ladrone Island bearing about  $163^{\circ}$  true, distant 19 miles.



Ass's Ears, bearing  $248^{\circ}$  true.

North-east Head.

Lingling I., bearing  
 $276^{\circ}$  true.

Lantau channel.

Lantau I.

Lema Islands from the Eastward. North-east Head bearing  $270^{\circ}$  true, distant about 9 miles.



*Charts 1180, Approaches to Hong Kong; also 3026.*

and has a peaked hill on its northern part; nearly half a mile westward of its middle part is Rock island, half a mile northward of which are some sunken rocks.

**Liungnib**, 7 cables long and 3 cables wide, lying one mile eastward of Wong mu, has a round islet off its southern end. Nearly one mile  $287^{\circ}$  true from the northern point of Liungnib are some rocks, which cover at springs and break in bad weather; and a rock, awash, lies nearly half a mile westward of the same point; therefore do not close the northern end of this island within  $1\frac{1}{2}$  miles.

**TONG HO ISLAND**,  $2\frac{3}{4}$  miles northward of Little Ladrone, is about  $1\frac{1}{2}$  miles long, east and west, about  $1\frac{1}{4}$  miles wide, and 561 feet high near its centre.

*Plan of Boddam cove, 1023.*

**Boddam cove** (*Lat.  $22^{\circ} 1' N.$ , Long.  $113^{\circ} 43' E.$* ), on the north-eastern side of Tong ho, is half a mile in length by  $1\frac{1}{2}$  cables wide, with 23 feet water at the entrance abreast Fort point, 18 feet well inside, and the bottom all soft mud. On either side the land rises steeply and terminates in a valley at the head of the cove, where there is a sandy beach. The cove affords good shelter to small vessels at all times, for although open to the north-east monsoon, the seas break at the entrance, and the rocks offer facilities for securing small craft with warps, rendering it a rendezvous for fishing junks in bad weather. Here a vessel may anchor, or be run into the mud towards the head without risk.

**Rocks.**—**North rock**, with less than 6 feet water, and steep-to, lies 2 cables off the north-east extreme of Tong ho; and a rock with  $1\frac{1}{4}$  fathoms water, also steep-to, lies in the eastern approach to Boddam cove, with North rock bearing  $288^{\circ}$  true, distant 7 cables; this rock is off the limits of the plan.

**Bouncer rocks**, two in number and close together, lie two-thirds of a cable north-eastward of the southern entrance point; the outer rock is awash at low water. Rocks extend south-westward of Fort point, and also about 70 yards off the point within it, some of these being above water, and one 11 feet high. About 90 yards south-west of the highest is a rock awash at high water.

**Directions.**—Boddam cove is not readily distinguished until within about 2 miles of the north-eastern part of Tong ho. Give a berth to North rock if coming from northward, and to the  $1\frac{1}{4}$ -fathoms patch if coming from the eastward, and bring the cove fairly open, bearing  $236^{\circ}$  true; steer in on that bearing, keeping the apex of Round hill at the head of the cove just open of two high-water points on the south-eastern shore to clear Bouncer rocks.

*General charts 2562, 2212, 2661a and b.*



*Plan of Boddam cove on 1023.*

**Supplies.**—Water may be obtained, also small supplies of beef, fish, poultry, and fruit.

**Tides.**—It is high water, full and change, in Boddam cove, at 9h. 40m.; springs rise  $4\frac{1}{2}$  feet. The flood stream sets north-west outside the entrance, and the ebb stream south-east, pretty strongly, but the streams are very weak inside.

*Plan of Nam sha bay on 1023.*

**Nam sha bay** is an indentation on the south-west side of Tong ho, and affords shelter during the north-east monsoon season.

A bank, with less than 3 fathoms, about a cable in extent, lies from one to 2 cables off its south point, with a rock with less than 6 feet water near its western edge. A rock with less than 6 feet lies half a cable off the north point of the bay, within the edge of the 3-fathoms contour. There is a sandy beach at the head of the bay, from which a road leads to Boddam cove.

*Charts 1180, Hong Kong approaches; also 3026.*

**PAK LEAK ISLAND**, or **Putoi**, about 2 miles across and 855 feet high, lies nearly  $1\frac{1}{2}$  miles northward of Great Ladrone, and on its north-eastern part is a remarkable conical hill. The hills on its southern side are studded with black rocks. On its eastern side and fronting Hoa ok islet is a cove where fishing junks shelter; on its northern side are some small bays in which water may be procured; and near its north-eastern point is a rock islet named House islet.

A rock, awash, lies close off South head, the southern point of the island.

**Clio rock** lies about 2 cables from the western side of Pak leak, with the north-western extreme of the island bearing  $351^{\circ}$  true, distant 4 cables.

**Chuk wan shan and Chuk chau islands** lie  $1\frac{1}{2}$  to  $3\frac{1}{2}$  miles eastward of Pak leak. Chuk wan shan, the larger and eastern island, has a small bay on its northern side, and Sharp islet, high and rocky, lies off its south-eastern point.

**Raleigh rock**, lying  $11^{\circ}$  true, distant  $1\frac{3}{4}$  miles from House islet, and nearly in mid-channel between Pak leak and White rocks, is a small pinnacle, with depths of 7 to 9 fathoms close to, and which breaks, when there is a moderate sea, at low-water springs.

**White rocks**, about  $2\frac{3}{4}$  miles north-eastward of Raleigh rock, are two high rocks half a mile apart, with a third and smaller rock above water, rather westward of the mid-position between them. About one mile  $132^{\circ}$  true of the southern rock is a rock awash at low water springs, with 9 fathoms close around.

*General charts 2562, 2212, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

**Channel.—Caution.**—The depth is about 9 fathoms in the channel between White rocks and Chuk wan islands, but this channel should not be used until it has been further examined.

**Tai lo island**, the southern of the range of small islands northward of Ladrone islands, is 590 feet high near its north-western part, sloping a little eastward, and lies northward from Liungnib, from which it is separated by a channel  $2\frac{3}{4}$  miles wide and clear, excepting the rocks off the northern point of the latter.

Tai lok, about half a mile northward of Tai lo, is a rocky islet, 395 feet high, with a large rock on its summit.

**Sam kok**, or Pyramid island, lying  $1\frac{1}{4}$  miles north-north-eastward from Tai lok, is 460 feet in height, and rugged in appearance. On its northern side there is a small bay or cove for boats, and the island affords fresh water.

Between Sam kok and Tai lok, is Sai lok, a small islet, and Ellis and Bird rocks, both above water; the channels between these are narrow, and the eddies so strong as frequently to render sailing craft unmanageable, therefore they should not be attempted.

**Chung chau si**, or West Water island, the northern of this range, lies north-east by north  $1\frac{1}{4}$  miles from Sam kok, and is 415 feet high. The depths are  $4\frac{1}{2}$  to  $5\frac{1}{2}$  fathoms about half a mile westward of the islands from Tai lo to Chung chau si, and 5 to 7 fathoms off the eastern side, but it has not been properly sounded.

The ebb stream sets strongly southward along the western side, and the flood in eddies north-westward.

**Chuk tu aan**, or Phillpott island, lies east-north-eastward about 3 miles from Tai lo; a reef extends 2 cables from its northern side, and a detached reef, partly above water, lies about 2 cables north-westward of it.

**Four-feet rock**, a small pinnacle, with 4 feet water, and 10 fathoms in its neighbourhood, lies  $25^{\circ}$  true, distant  $1\frac{3}{4}$  miles from Chuk tu aan, and nearly midway between that island and the western end of Chung chau.

**Chung chau**, or Lueng island, which, with the islands south-eastward of it, bound the south-western side of Lantau channel, lies  $2\frac{1}{2}$  miles south-westward of the south-western point of Lantau; it is  $1\frac{1}{2}$  miles long, north-west and south-east, and 490 feet high, with a peaked hill near its northern point. There is a boat cove on the northern side of the island, and a short distance off its north-western point is a high round islet, with a large rock on its summit.

*General charts 2562, 2212, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

**A rock**, with  $1\frac{1}{2}$  fathoms, apparently steep-to, lies about 2 cables off the north-west side of the island. There are strong eddies between Chung chau and Lantau.

**Nau tau** (*Lat.  $22^{\circ} 9' N.$ , Long.  $113^{\circ} 49' E.$* ) is small but high, and separated from Chung chau by a narrow channel 3 cables wide, named Nau tau mun, or Bullock head gate, in which there is shoal water close to Chung chau. The depths in the bay to the southward, which it forms with Lafsami, are 3 to 5 fathoms, but it has not been surveyed.

**Lafsami island**, close southward of Nau tau, is 785 feet high, and on some bearings appears as a peak; about three-quarters of a mile eastward of its southern point is Rocky islet, on which are some fishermen's huts.

Lafsami is inhabited on its south-western side, where fresh water may be obtained in a small bay.

**Chi chau**, 3 miles east by south from Lafsami, forms the southern side of the eastern entrance of Lantau channel. The island is 820 feet high, round in shape, inhabited, and separated by a narrow channel from Si chi chau, a smaller and lower island, on its western side. A sunken rock lies off its north-eastern point, and a patch of 4 fathoms about a quarter of a mile off its northern point.

Between Si chi chau and Rocky islet is a safe channel  $1\frac{1}{2}$  miles wide, which may be used when bound for Canton river after entering from the southward between Chuk wan shan and Ai chau.

**Soko islands**.—A chau, the southern of the Soko islands, and nearly 4 miles south-eastward of the south-western point of Lantau, forms the northern side of the eastern entrance of Lantau channel. A chau rises very steeply to the height of 525 feet.

Water may be procured at a little sandy beach on the northern side of A chau.

North Soko island, lying nearly half a mile northward of A chau, is about one mile long, east and west, and very narrow in the middle.

A sand spit extends westward upwards of  $1\frac{1}{2}$  miles from its western side.

A rocky islet and two rocks above water lie between the Soko islands; also, High rocky islet is three-quarters of a mile south-eastward of A chau, but the ground is foul between. The whole of the group apparently lies within the 5-fathoms contour, extending south-eastward of the south-west extreme of Lantau.

**AI CHAU**.—These islands, two in number, lie about  $4\frac{1}{2}$  miles east-north-eastward of Chuk wan shan, and the eastern and larger

*General charts 2562, 2212, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

island is separated from the smaller by a very narrow channel, with 4 fathoms water.

**Hill islet** (*Lat. 22° 4½' N., Long. 113° 56½' E.*), lying 1½ miles north-eastward of the eastern Ai chau, is surrounded by rocks, at a short distance from which is a depth of 11 fathoms.

**SA MUN, or Three gates**, a group of three small islands, lies about 3½ miles eastward of Ai chau, and extends about 3 miles north-west and south-east, with narrow passages between the islands. Close north-westward of Hak chau, the north-western island, are the Peaked islets; and half a mile north-eastward of the central island, is Gauze, a high rocky islet, with a reef of rocks lying between; the southern end of the south-eastern island, Hung kong chau, the highest part of the group, is a round hill, 492 feet high.

A small bay on the south-western side of the central island affords shelter to two or three vessels during a north-east gale, with anchorage in 6 to 10 fathoms, mud.

**LINGTING ISLAND**, 3 miles north-eastward of the Sa mun group, is about 1½ miles long, east and west, 7 cables wide, of a rugged appearance, and rise to a peak 1,181 feet high, near its centre.

**Needle rocks** are two sunken pinnacles close together, lying about 1½ cables south-westward of the low rocky north-western point of Lingting; there is a depth of about 6 feet on them, and with a swell they are probably marked by breakers or rippings.

**Rocks.**—A rock, which dries 5 feet, lies three-quarters of a mile 84° true from the north-east extreme of the island, and a rock, 11 feet high, lies the same distance 101° true of the same extreme; both apparently steep-to, but foul ground between them.

**Caution.**—Give the north-eastern side of Lingting a wide berth, especially at night.

#### CHU KIANG OR CANTON RIVER ESTUARY.

**GENERAL REMARKS.**—The approach to the estuary of Chu kiang or Canton river lies between Macao island and others southward of it, on the west side, and Lantau island on the east side. Great West channel on the western or Macao side is used by sailing vessels during the south-west monsoon period; the low water depths are not greater than 4 fathoms; one of the islands on the eastern side of this channel is included in the 5-fathoms contour, extending from the western shore, thus forming a bar.

*General charts 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026.*

Lantau channel is deep, as is also Lema channel, the approach from the eastward. There is a channel eastward of Lantau, leading north-westward from Hong Kong; full details will be found of these in the following pages.

**Caution.**—The depths in the channel westward of Lintin bar, and in other parts of the entrance of Canton river are reported to have changed considerably since the date of the survey. See page 441 for the river.

**WESTERN SHORE.**—The island of Wung kum, or Montanha, and Ko ho northward of it, have been described with West river. Northward of Taipa, the northern islet, is Macao harbour.

*Plan of Macao harbour on 2212, and chart 2562. Var. nil.*

**MACAO HARBOUR.** — Macao (*Lat.*  $22^{\circ} 11\frac{3}{4}'$  N., *Long.*  $113^{\circ} 32\frac{3}{4}'$  E.), a Portuguese settlement in China is situated eastward of the entrance to the Si kiang or West river, and close eastward of Lappa, Tui lien shan or Patera island, on a small peninsula projecting from the south-eastern end of Macao island. The peninsula is nearly 2 miles long, less than one mile wide at its broadest part, and is connected with the island by a low, narrow sandy isthmus, across which extends a barrier wall to exclude foreigners from the interior of the island. The town is built on the slope of the hills, which are 200 to 300 feet in height. Guia fort, with its lighthouse, occupies the summit.

**Taipa, or Kaikong** island lies on the south side of Macao roadstead; it consists of two parts, connected by a sand ridge. There are villages in the bay on the south-west side of the eastern part.

Cabrita point is its north-east extreme; Colowan or Koho island, southward of it, has been mentioned with West river approach. The depths seaward of it are reported to have shoaled 2 fathoms (June, 1910), as noted on the charts.

**Outer anchorage.**—There is anchorage, in about 4 fathoms, mud bottom, at from 7 to 8 miles 101 true of Guia fort light.

**Bank extended.**—The 3-fathoms contour of the bank forming the roadstead of Macao was reported in 1909 to have extended about three-quarters of a mile in a south-easterly direction; a depth of  $2\frac{1}{2}$  fathoms was found  $1\frac{1}{2}$  miles east-north-eastward of Lady Franklin rock. Vessels above 14 feet draught should not go inside or westward of the bearing of Koho point,  $225^{\circ}$  true.

**Lady Franklin rock**, with 13 feet water, lies between the outer anchorage and the roadstead, 8 cables  $61^{\circ}$  true from Cabrita point, the north-eastern point of Taipa island.

*General charts 2562, 2212, 2661a.*

*Plan of Macao harbour on 2212, and chart 3026. Var. nil.*

**LIGHTS.**—From a circular tower, with white lantern and red cupola, 44 feet high, at Fort Guia, on the south-eastern side of Macao peninsula, is exhibited, at an elevation of 333 feet above high water, a *group flashing white light*, showing a group of *two flashes every ten seconds*, visible from a distance of 25 miles in clear weather.

A signal mast and some yellow dwellings are near the lighthouse.

It will naturally not be visible over the high islands southward of it.

On the south extreme of the peninsula, east side of the harbour entrance, from a stone column 10 feet in height, is exhibited, at an elevation of 50 feet, a *fixed white light*, visible about 6 miles.

On Barra fort, at about 150 yards north-west of the above, is exhibited, from a red iron structure, 16 feet in height, a *fixed white light*, at an elevation of 31 feet, visible 4 miles.

**The harbour** is formed between the peninsula and Tui lien shan or Patera island, to the westward; it is about  $1\frac{1}{2}$  miles in length and 3 cables in breadth, about a quarter of a mile wide in the entrance, and has depths of 2 to 3 fathoms on the town side, but the western side is encumbered with sandbanks. There is less water in the approach over the fairway bank, but a channel, 111 feet wide, with a depth of 11 feet at low water, has been dredged close northward of the buoy, the axis of which is with Malo chau bearing about  $248^{\circ}$  true. The bottom is soft mud.

There is an excellent landing pier.

**Dangers.—Pedra Arêca.**—A bank, with from 3 to 6 feet water, fronts the peninsula at a distance of 3 to 5 cables, and which has not been properly surveyed; it is apparently about 2 miles in extent, but the depths seaward of it are probably less than charted, as above stated, with the outer anchorage.

Pedra Arêca, dry at low water, is situated at the west extreme of this bank, 4 cables south-eastward of the south extreme of the peninsula.

A patch of one fathom is charted 2 cables southward of the extreme of the peninsula, east point of the harbour entrance, and others as charted.

**Buoys.—Beacons.**—Pedra Arêca is marked by a black can buoy.

A fairway buoy, conical, painted red and black in horizontal stripes, is moored about 7 cables south-eastward of Guia lighthouse, on the bank above mentioned. The dredged channel is marked by small black buoys.

Pedro de Meio, a rock situated 2 cables off Jolo point, west side of north-west entrance to the channel south of Taipa island, is reported

*General charts 2562, 2212, 2661a and b.*

*Plan of Macao harbour on 2212, and chart 3026. Var. nil.*

to be marked by an iron pole with a spherical cage, and painted red and white. (Chinese Light list, 1912.)

**Directions.**—There are no dangers outside the harbour for such vessels as can enter it. Guia lighthouse, bearing  $270^{\circ}$  true, should be steered for until Cabrita point bears  $180^{\circ}$  true, when course should be altered across the bar northward of the fairway buoy, with Malo chau ahead bearing  $248^{\circ}$  true. When approaching Pedra Arêca buoy haul up for the entrance, avoiding the one-fathom patch charted  $1\frac{3}{4}$  cables off its eastern point, thence northward into the harbour, passing about a cable distant from Fort Barra, from which a shoal extends about half a cable.

Moor northward of that fort in about 17 feet at low water.

Attention is necessary to the tidal streams, which run strongly round the east point of entrance.

**Tides.**—It is high water, full and change, at 10h. 2m.; with a spring rise of about  $9\frac{1}{2}$  feet, and a neap rise of about  $6\frac{1}{2}$  feet.

**Macao.—Population.**—The population of Macao is about 78,000.

**Communication.**—Macao is in telegraphic communication with Hong Kong, and from thence to all parts. Daily communication by steam vessels is maintained with Hong Kong and Canton.

**Supplies.**—No patent fuel or liquid fuel is obtainable, and there is only a small amount of coal, about 50 tons, in stock. About 1,200 tons are imported annually.

**Time.**—Standard time, corresponding to the 120th meridian of East longitude or 8h. fast of Greenwich mean time, is kept at Macao.

**Trade and shipping.**—The principal articles of export are opium, cotton goods, flour, silk, tea, matches, and oil; and of import, fans, firewood, mats, silk, sugar, and tea. The shipping at the port is mostly confined to junks, and some 16,000 junks enter and clear annually, with a total tonnage of about 900,000 tons.

**Climate.**—Macao being open to the south-west monsoon is more agreeable and salubrious during the hot season than Hong Kong, and although by no means exempt from the diseases prevalent in that colony, yet sanitary improvements have much increased the healthiness of the town.

The mean temperature for the year is  $75^{\circ}$  Fah.; for January and February,  $61^{\circ}$ ; for June to August,  $85^{\circ}$ ; and the annual rainfall is 69 inches. See Meteorological table, page 565.

*General charts 2562, 2212, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026. Var. nil.*

**INSHORE CHANNEL to West river.**—**Malo chau pass.**—A vessel drawing 10 feet has passed through this channel northward of Taipa, Macarira, and Mong chau, into the Broadway, at high water.

**Rock.**—A rocky patch, about 400 feet long north-east and south-west, and 200 feet broad, with two pinnacles near its middle, on which there is a depth of 3 feet at low water springs, lies about 100 yards southward of mid-channel between Malo chau and Macarira. A conical buoy, chequered black and red, is moored close eastward of the pinnacles. The passage northward of the buoy is the better of the two.

**COAST.**—**Kau chau** (*Lat. 22° 15' N., Long. 113° 37' E.*), or Nine islands, a group of islets situated north-eastward about 4 miles from Macao, lie close together, and the depth is 3 fathoms at about half a mile eastward of the outermost islet; a rock always above water lies about a quarter of a mile southward of the southern islet of the group.

There is anchorage for small craft in from 5 to 6 fathoms westward of this group, with some shelter from the north-east monsoon; the approach has from  $2\frac{1}{2}$  to 3 fathoms water.

The rock above water is a good mark for approaching the anchorage.

**Heung chau bay**, north-westward of Kau chau islands, has Yeh Lee island in its southern part and White rock or islet at about  $1\frac{3}{4}$  miles seaward of it; there is a rock which dries 3 feet at low water nearly midway between the two. Yeh Lee island is foul, as charted.

The depths within Yeh Lee island are less than one fathom, and the 3-fathoms contour is at least 3 miles off-shore.

*Chart 3588.*

**Kum sing mun harbour** (*Lat. 22° 23' N., Long. 113° 38' E.*).—At Bluff head, about 11 miles northward of Macao, the coast turns abruptly westward and forms Kum sing mun (Golden sun-born pass) harbour, which is safe for small vessels. The approach from the southward has apparently about  $3\frac{1}{4}$  fathoms between the 3-fathoms contour fronting the shore bank, and that enclosing a tongue with less than 3 fathoms, extending about 5 miles southward of Ki au island which forms the north side of the entrance. The water deepens abreast Bluff head to 10 fathoms, and to 10 to 16 in the actual entrance, half a mile wide, north of the bluff, between it and Ki au, but it soon shallows to the half-tide rock situated near the edge of the 3-fathoms contour line.

Anchorage may be obtained at about half a mile westward of the islet, off the south extreme of Ki au, in about 5 fathoms, soft bottom,

*General charts 2562, 3026, 2661a and b.*



*Chart 3588. Var. nil.*

avoiding the shoal patches shown on the plan. The plan is not reliable.

**Tides.**—It is high water, full and change, in Kum sing mun harbour at 0h. 6m.; springs rise  $6\frac{1}{2}$  feet, neaps  $5\frac{1}{2}$  feet.

**COAST.**—For the coast northward and channels leading to West river, &c., see page 438.

*Charts 1180, Approaches to Hong Kong; also 3026.*

**EASTERN SHORE.**—The islands and dangers (Ladrone, &c.) forming the eastern side of the approach, southward of Lantau, have been described, pages 425-433.

**LANTAU**, or Tai ho island, forms the eastern side of the approach northward of the islands before mentioned. It is separated from Hong Kong island eastward of it by West Lamma channel, is nearly 15 miles in length, north-east and south-west, and its greatest breadth is about 5 miles. The island is high, and about its centre are several peaks, the summit being 3,064 feet above the sea.

Close to the western coast of Lantau, and  $1\frac{1}{2}$  miles from the southern point, is Peaked hill, which is insulated at high water.

A rock above water lies about  $346^{\circ}$  true one mile from Peaked hill and half a mile from the island. At  $1\frac{1}{2}$  miles north-eastward of this rock is Bluff point, and south-eastward of the latter a bay, in which is Tai ho village, where there is a creek to which a boat can enter at high tide. South of the village are two bays, both of which are shallow, but fresh water may be procured in them.

**Pa lo wang.**—On the northern side of Lantau, and nearly 3 miles north-eastward of Bluff point, are two projecting points half a mile apart, between which is Pa lo wang, bay and village, and northward of the eastern point of the bay, and about a quarter of a mile distant is an islet 138 feet high, having a rock awash close off its north-western extreme, and a rock 4 feet high about  $1\frac{1}{2}$  cables southward of it. Eastward of the islet is Tung chung bay, which is shallow and has Tung chung village at its head. There are fishing stakes in this locality and elsewhere.

The continuation of the description of Lantau island will be found on pages 480, 487.

The following islands and dangers lie in the western approach to Kap sing mun, leading to Hong Kong, which channel is described on page 485.

**Chu lu kok**, an island about 2 miles north and south, of irregular shape, and 400 feet in height, lies northward of Tung chung bay.

*General charts 2562, 2661a and b.*

*Charts 1180, Approaches to Hong Kong; also 3026. Var. nil.*

Red point, 142 feet high, its north-eastern extreme, has a remarkable rocky appearance, and is frequented by stone cutters, who cut the granite into slabs for building.

**The Brothers.**—East-north-eastward of Red point, at  $1\frac{1}{4}$  miles, is West Brother, 212 feet, and at  $2\frac{1}{4}$  miles East Brother or Motoe islet, 193 feet in height.

Reef islet, 30 feet high, lies half a mile southward of East Brother.

**Saw chau**, lying 3 miles north-westward of Red point, is 198 feet high, and nearly one mile long; there is a sharp hillock at its northern end. Tree islet, 30 feet high, lies about 7 cables  $287^\circ$  true from the northern part of Saw chau, and White rock, 7 feet high, lies about  $309^\circ$  true, 4 cables from Tree islet.

**Tong ku**, about one mile northward of Saw chau, is 267 feet high, and rocky in appearance.

**The coast** of the mainland westward of Kap sing mun (page 490), is high, and also steep to as far as Brothers point, at about 2 miles westward of Ma wan, south side of the narrows; thence to Pillar point,  $4\frac{1}{2}$  miles further west, there are some creeks and Castle peak bay, which is shallow. A 3-fathoms patch lies  $101^\circ$  true,  $1\frac{1}{2}$  miles from Pillar point. From Pillar point to a point  $1\frac{3}{4}$  miles westward, the shore is fairly steep at a distance of 2 cables; thence to Black point, the north-western point of Chung saw wan, or Castle peak promontory, shallow water extends over half a mile off the land.

**TONG KU HARBOUR or URMSTON ROAD** (*Lat.  $22^\circ 22'$  N., Long.  $113^\circ 54'$  E.*), between Tong ku and Saw chau on the west, and the coast of Chung saw wan on the east, is a safe and tolerably sheltered anchorage. Steam vessels bound to Canton anchor here and off Castle peak bay eastward of it at night. The best berth is in about 9 fathoms with Tong ku peak just open southward of Lintin and nearer the mainland than Tong ku, where smooth water has been found during an easterly gale. The tidal streams are strong. Fresh water can be procured in abundance.

*Chart 3026, Macao to Pedro Blanco.*

**HAU HOI WAN**, or Deep bay, has its entrance between Black point and South-west point of Nam tau, about 4 miles northward, and it extends north-eastward 9 miles; the bay is shallow, with a narrow  $3\frac{1}{4}$ -fathoms channel leading 5 miles into it.

**Nam tau**, a peninsula 3 miles long, north-east and south-west,  $1\frac{3}{4}$  miles wide, and 1,100 feet high, juts out from the main with which

*General charts 2661a and b.*

*Charts 2562, 3026. Var. nil.*

it is connected by lower land. The south-western coast of Nam tau outside the line of the points is fairly steep-to.

**Ma chau**,  $1\frac{1}{2}$  miles  $280^\circ$  true from the north-western point of Nam tau, forms two connected islets, the south-eastern being 152 feet and the north-western 220 feet high. On the north-western side of Ma chau is a settlement, the lights of which form a good mark at night; being close together they are easily distinguished from the numerous lights of the junks. A spit with from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  fathoms extends a mile southward of the southern end of the islets.

**Tai shan**, an island 383 feet high, lies north-eastward of Ma chau, from which it is separated by a channel about 4 cables broad. Junk patch, with less than 6 feet, lies about 6 cables northward of the east extreme of Tai shan.

**Syah islét**, 83 feet high, lies north-westward about 2 miles from Tai shan.

**Tai shan bay** is the shallow bight eastward of Tai shan and Syah islets; in it are Ma un chau, 103 feet high, and Yau i chau, 206 feet, on the mud flat which fills it.

**Kong su bank**, about 4 miles in length, with a rock near its north end, has depths of less than one fathom; it is steep-to on the channel side.

**Fishing stakes** are placed in the channel leading westward of Ma chau, at about  $1\frac{1}{2}$  miles north-westward of Syah islet, and marked by *fixed white lights* at night (extremes probably, but *see the chart*).

**LINTIN ISLAND** (*Lat.  $22^\circ 25' N.$ , Long.  $113^\circ 48\frac{1}{2}' E.$* ), lying 3 miles west-north-westward from Tong ku, is about 6 miles in circumference, and it rises to a conical peak, 1,140 feet high. A rock awash at high water lies about 2 cables off the middle of its north-eastern side.

**South Sand spit**, with depths of one to 3 fathoms, extends  $4\frac{1}{4}$  miles southward of the island, and within a depth of 5 fathoms to 6 miles; it is tolerably steep-to on its western side, with 6 to 10 fathoms near it.

There is anchorage off Lintin at about  $1\frac{1}{2}$  miles from the sandy beach on its south-western side, in 8 fathoms; from this depth the water shoals quickly towards the island.

Fresh water can be obtained at the eastern end of the beach on the south-west side of Lintin; and occasionally a few bullocks and some vegetables may be procured from the inhabitants.

*General charts 2661a and b.*

*Charts 2562, 3026. Var. nil.*

**Lintin bar and sandbank.**—A sandbank extends north-north-westward  $12\frac{1}{2}$  miles from Lintin, and a narrow ridge with a least depth of  $1\frac{1}{2}$  fathoms on its northern part is named Lintin bar.

**Fan si ak bank** is situated on Lintin sandbank, from 2 to  $4\frac{1}{2}$  miles northward of Lintin island; it is not much shallower than the bank, the least water charted being  $1\frac{3}{4}$  fathoms; Fan si ak rock, 61 feet high, and White rock, 40 feet high, westward of the latter, are situated near its north extreme.

**Fan si ak channel** is charted as leading from westward of Ma chau island, westward of the fishing stakes, which block the channel eastward of it, above mentioned, as carrying lights; about 14 feet seems the best water at low tide over the flats, but there is deeper water close westward of the stakes,  $3\frac{1}{2}$  fathoms according to the charts.

**Caution.**—It has been reported that the fairways north-north-westward of Lintin island are much changed since the survey was made; extreme caution is therefore necessary.

**Tides and tidal streams.**—In the entrance to Canton river, it is high water, full and change, at 10h. 0m.; springs rise about 8 feet. From October to March the neaps are irregular, sometimes only one tide in the 24 hours; the rate of the tidal stream is 3 to 4 knots at springs, increased during freshets. Southward of Lintin sandspit the chart states that the tides are irregular with under currents.

*Chart 1741, Lankit spit to Tiger island; also 3588, 3026.*

**LANKIT ISLAND** (Lat.  $22^{\circ} 41' N.$ , Long.  $113^{\circ} 39' E.$ ) lies 19 miles north-north-westward of Lintin island; the hill on the western part attains a height of 220 feet. At the western end there is a well of fresh water near a small temple close to some trees; this part of the island is covered with earthen vessels containing human bones. Lankit hump, with less than one fathom water, extends  $1\frac{1}{2}$  miles south-south-east of the island, continued under the name of Lankit spit, with less than 2 fathoms for a further distance of three-quarters of a mile, according to the chart, but considerable alterations have taken place here, as before mentioned.

**Frazer bank** with patches, dry at low water, are on the southern part of a narrow sand ridge, some 10 miles in length, westward of Lankit island and parallel to Lankit entrance.

**Fishing stakes.**—There are usually some fishing stakes with boats made fast to them between Lintin and Lankit and in various other places; care must be taken not to run over the boats which generally show lights at night.

*General charts 2661a and b.*

*Charts 1741, Lankit spit to Tiger island; also 3588, 3026.*

**Tides.**—It is high water, full and change, at Lankit, at 11h. 20m.; springs rise  $6\frac{1}{2}$  feet, neaps  $5\frac{1}{2}$  feet, according to the Tide tables.

**Sam pan chau**, or Boat islet, 44 feet in height, north-north-eastward  $1\frac{1}{2}$  miles from Lankit, has a rounded summit, resembling a boat, bottom up. It is encircled by a rocky bank with patches which dry 7 to 8 feet for about half a mile, and a bank with less than 2 fathoms extends  $1\frac{3}{4}$  miles north-north-west of it, with scarcely better water between it and the flat extending south-eastward from Tai kok tau.

*Charts 3588, 2562.*

**WESTERN SHORE** of the estuary, continued from page 438.

**Coast.**—Between Kung sing mun harbour and Tai kok tau island, 22 miles to the northward, lie the entrance to the channels and creeks leading to West river, &c. General information on these, which lie within Wang mun, will be found on pages 467-477.

**WANG MUN.—Junk Fleet entrance.**—Wang mun (*Lat. 22° 35' N., Long. 113° 35' E.*) is approached by Junk Fleet entrance, which lies between Wang mun bank, dry at low water, fronting the shore on the west and the swashway spit and its extension, 8 miles southward of Wang mun creek light, on the east; about  $2\frac{1}{2}$  miles within the extreme of this extension, is Entrance patch, dry at low water. The channel apparently has a low-water depth of about 8 feet on its bar between Ki au island and Entrance patch, deepening within, but the entrance to Wang mun, northward of Cone and Crag islands, has a charted depth of only 3 feet.

The entrance to Wang mun is marked by High Cone, 887 feet high, and Cone island below it, on the south side of it.

**Lights.**—On the western edge of Swashway bank, from a mast over a white hut on a black pile structure, is exhibited, at an elevation of 40 feet above high water, a *group occulting white light every thirty seconds*, visible 10 miles in clear weather. It shows four eclipses, thus:—light, *sixteen seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*.

On the northern side of the entrance to Wang mun, from a pole with black ball, a *fixed red lantern light* is exhibited, at a height of 34 feet, visible from 2 to 4 miles.

Wang mun is continued north-westward by Kerr channel and Sailam channel, and south-westward by Nemesis creek, all eventually leading into West river.

**Tam chau channel** discharges westward of Wang mun creek light on Swashway bank, into Junk Fleet entrance. See page 470.

*General charts 2562, 2661a and b.*

*Charts 3588, 2562. Var. nil.*

The shore northward of Wang mun creek light consists of mud-flats fronting rice fields, partly reclaimed land, and extending nearly to the bank westward of Lankit island; this bank dries 2 feet at low water, on its south end is Frazer bank, mentioned on page 441.

The channel between Lankit island and this bank is known as the Lankit entrance, and it leads southward of Tai kok tau island, to the entrances of Tai kok tau, Barrier, Mount, and other channels, and under other names lead through the delta to West river, and also to Canton.

*See the general remarks and directions for all these on pages 467-477.*

**Western shore** continued on page 448.

*Charts 1180, 3026, 2562.*

**DIRECTIONS.—Canton river estuary.—General remarks.**—The following directions are for approaching the entrance to Canton river, which may be considered to commence abreast Lintin island, in about lat.  $15^{\circ} 25' N.$ , which is over 30 miles from the outer islands, the south-west extreme of which is marked by Gap rock lighthouse. Owing to the changes in the channel about that island, vessels should not proceed without a pilot unless well acquainted with the river. *See view of the Ladrones, on page 428.*

During the south-west monsoon the Great West channel seems the most convenient approach for sailing vessels, and during the north-east monsoon the Lema, and its continuation, the Lantau, channel. Some of the passages between the outlying islands are also available, as below remarked. The directions mostly apply to sailing vessels, but the notes on the tidal streams are useful for all vessels. There seems no difficulty in entering in steam vessels during daylight.

*See caution as to fishing fleets, page 425.*

**Making the land.—Aspect.—Tidal streams.**—The channels amongst the islands in the approach to Chu kiang estuary being mostly navigable, the mariner need not hesitate to go through the nearest convenient channel without a pilot, if the weather is not thick, avoiding such spots as are marked not recommended on the charts. The streams must be attended to as they set in varying directions amongst the islands lying south-eastward according to the prevailing winds; a strong easterly wind generally producing a westerly current which the ebb tidal stream reduces in strength.

A pilot, can one be obtained, may be useful to run the vessel into a place of shelter, in case of bad weather; Macao road should not then be used, but the vessel should proceed up the river well above Lintin, or, better still, to Urmston road on the eastern shore, south-eastward of Lintin.

*General charts 2661a and b.*

*Charts 1180, 3026, 2562. Var. nil.*

If making the land in thick weather it may be noted that the Kaipong and Lema islands, excepting Tan kam, which is long and of an undulating form, are detached, high and uneven, with depths of 20 fathoms fairly close to, whereas the islands between Great Ladrone and St. John to the westward are large and of regular appearance, resembling a coast more than islands, with depths of only 10 and 11 fathoms at a considerable distance outside them.

The freshets out of Chu kiang, through Great West channel, set almost constantly from the southern end of Wung kum, along the coasts of the islands to the westward, at the rate of one to 2 knots an hour, particularly with strong easterly winds, and although at times there seems to be a surface stream setting eastward or into the entrance of the river, the freshets underneath continue to run westward, by which sailing vessels are sometimes rendered unmanageable, even in fresh winds. Many vessels from this cause, after getting near Wung kum, or between it and Potue island, have drifted nearly to St. John island, whilst endeavouring with moderate winds to keep eastward.

Steering, therefore, for the Great West channel, to avoid being drifted westward, never borrow near San chau, or the other islands to the westward, unless it is blowing hard from the south-west.

The freshets abate at times, and then weak tidal streams set eastward, but as these are not of long duration, keep on the eastern side of the channel towards the Ladrone islands and Potue, and anchor at once if drifting westward.

In the strength of the south-west monsoon, if the wind be steady between S.E. and S.W., make Great Ladrone bearing about 0° true, and avoid the islands to the westward; this is especially necessary after the middle of August, when easterly winds prevail for several days together, as they do more or less, at all seasons. On falling to leeward about St. John in September or October, a tedious passage is generally made to Macao by keeping close along the islands, where the currents or freshets setting westward oblige frequent anchoring, but the best plan, as these freshets prevail only in shoal water near the islands, is to stand well off the land and take advantage of favourable shifts of wind to get eastward.

Between Macao road and Lintin, the streams are frequently irregular, setting in a different direction at the surface to what they do underneath, by which vessels are sometimes rendered unmanageable in light winds. The ebb is stronger and continues longer than the flood; the freshets often run out below when the flood stream is running at the surface.

*General charts 2661a and b.*

*Charts 1180, 3026, 2562. Var. nil.*

When working up weigh instantly the stream slackens sufficiently to make any progress, in whatever part of the channel anchored.

**Great West channel**, westward of the Ladrone islands, is generally used when bound to Canton river during the strength of the south-west monsoon, or from about June to August inclusive. A berth should be given to the islands southward of Macao, as the water is reported to have shoaled 2 fathoms in that neighbourhood.

Late in the season when the winds have easting in them, or at any time with northerly or easterly winds, as there is a risk of being driven westward by the freshets setting out of the Great West channel, a sailing vessel should proceed by Lema and Lantau channels. Typhoons generally commence in a moderate gale from the northward, which is a leading wind for these channels, and as the wind commonly veers eastward before it blows hard, a vessel with the first of the gale may get up the river to or above Lintin, where these storms are less violent than outside among the islands. *See also* the anchorages mentioned with Lema and Lantau channels, below.

**Lema and Lantau channels**.—Lema channel, between Lema islands on the south, and Pu toi group on the north, page 495, is about 6 miles wide; it should, if possible, be always adopted in sailing vessels bound to Hong Kong harbour, or Canton river, in the north-east monsoon, and therefore North-east head of Tamkan island, the easternmost of the Lema group, should be made on a westerly bearing. *See view b* on page 428.

In thick weather, when the land cannot be discerned above 3 or 4 miles, with strong east to south-easterly winds it may be prudent to lay to outside the channel; do not then shoal the water to less than 26 fathoms, as in this depth a ship will drift seaward of all the islands.

Taitam bay, Tathong channel, and East Lamma channel, all described with Hong Kong, afford shelter in a typhoon, if an anchorage is gained before night.

From about 2 miles southward of Pu toi, the course to the entrance of Lantau channel is about 270° true, for 20 miles, passing northward of Lingting island, which channel is preferable for working in, being wider and more direct. Give a wide berth to the rocks north-eastward of Lingting and to Needle rocks off its north-west point.

**Lantau channel**, between Soko islands and the south-western end of Lantau on the north, and Chi chau, Lafsami and Chung chau on the south, is nearly 2 miles wide and clear, with a general north-westerly direction.

The water is shallow on the north side within a line joining the south-western point of Lantau and A chau, of the Soko group; but the

*General charts 2661a and b.*



*Charts 1180, 3026, 2562. Var. nil.*

southern side is fairly steep-to westward of Chi chau. When clear of Lantau channel, or about 2 miles off the west end of Lantau, if bound for Canton river, steer to pass about a mile westward of Lintin island, but not proceeding above that island without local knowledge. Vessels can lie securely during a typhoon above Lintin bar.

Urmston road is easily reached, and from the position mentioned off Lantau, Castle peak, 1,920 feet high, bearing  $42^{\circ}$  true, if steered for, will lead in between San chau island and Chu lu kok bank in not less than  $3\frac{1}{4}$  fathoms at low water. When the 2,800-foot peak on Lantau bears  $158^{\circ}$  true, or if the mountain is clouded over, Red point, the north extreme of Chu lu kok, bearing  $146^{\circ}$  true, haul to the northward, with either object, astern, on the bearings given, and proceed on that line, anchoring as requisite. Vessels also can haul eastward from the bearings given, during the south-west monsoon period, finding more sheltered anchorage northward of the Brothers.

The tidal streams must be considered; and keeping a good look-out for fishing stakes.

**Tidal streams.**—During south-westerly winds, it is sometimes difficult to turn through Lema channel from the eastward as there is generally an easterly set, the ebb stream out of the numerous channels setting eastward and the flood north-eastward; with strong south-westerly winds, the rate of the stream is about  $1\frac{1}{2}$  knots an hour.

The ebb runs through Lantau channel in strong eddies, particularly in July and August, when its rate is sometimes  $4\frac{1}{2}$  knots an hour at springs. With a light wind, at times, it is difficult to manage a sailing vessel here.

The ebb stream eastward of Lintin sets southward, but westward of the island it sets south-eastward.

**Tai ta mi channel.**—Coming from seaward through Tai ta mi channel, between Lema and Kaipong islands, pass well north-eastward of Cambridge rock, and steer for Lingting; pass between it and the Sa mun group, and then through Lantau channel; or, pass between the Sa mun group and Ai chau, and thence through Lantau channel; or, as before mentioned, through any of the channels between the islands that are fairly wide and clear.

*Charts 3588, 2562; &c.*

**CHU KIANG or CANTON RIVER.**—The entrance of the Chu kiang, or Canton river, between the islands of Chuen pi and Tai kok tau (*Lat.  $22^{\circ} 45' N.$ , Long.  $113^{\circ} 38' E.$* ), or perhaps more strictly between Anung hoi and Tai kok tau, is divided by the Wan-tong islands into the two channels, Boca Tigris and Bremer channel; Boca Tigris, the eastern, is generally used for navigation.

*General charts 2562, 3026, 2661a and b.*

*Charts 3588, 2562, &c. Var. nil.*

**Navigable depths.**—A draught of 17 feet 6 inches is the greatest that the pilots can take up to Canton at high water springs and 15 feet 6 inches at high water neaps, and this by Blenheim passage (page 458), in which is Tai shek barrier, and above it Parker point bar; the least depth is  $10\frac{1}{2}$  feet (about  $18\frac{1}{2}$  feet at high water springs) over the natural barrier westward of Parker point (*Lat*  $23^{\circ} 3\frac{1}{2}'$  *N.*, *Long.*  $113^{\circ} 17'$  *E.*), or about 4 miles below the city. The Tai shek barrier, 2 miles below, has 12 feet on the north side and 10 feet on the south side, at low water springs.

Vessels above  $17\frac{1}{2}$  feet draught cannot usually go above Hamilton creek, 6 miles below the city.

In the north-east monsoon season there will be about one foot more water with the night tide than with the day tide, and in the south-west monsoon the reverse.

In the south-west monsoon period the level of the river is apparently a foot higher than in the opposite season.

The tide gauges, below mentioned, should be looked at before passing them.

Second bar, about 20 miles below Canton, or that nearest the mouth of the river, can be crossed by vessels of 23 feet draught, which can also reach Whampoa, 8 miles below Canton. First bar, the Whampoa approach, is 7 miles above Second bar.

The passage between Whampoa and Canton by Whampoa channel should not be attempted by vessels drawing over 11 feet.

Gunboats have ascended various arms of the river several miles above Canton.

The China Coaster's Tide Book and Nautical Pocket Manual, published annually, contains reliable information on matters relating to Chinese ports, up to date.

**Tide gauges** are established at Belcher reach (First bar), Tai shek barrier, Tai mai light-beacon (Parker or 26th point) and Shamien, Canton city; *see* those places for details.

*Chart 1741, Canton river, sheet 2; also 3588.*

**River, above Lankit island,** continued from page 442.

**Boca Tigris.—Eastern shore.**—Chuen pi and Anung hoi islands forms the eastern side of Chuen pi channel and Boca Tigris, its continuation northward. The channel has not less than  $5\frac{3}{4}$  fathoms, and abreast Chain rock, the narrowest part,  $4\frac{1}{2}$  cables wide, it deepens to 16 to 18 fathoms.

**Chuen pi point** (*Lat.*  $22^{\circ} 45'$  *N.*, *Long.*  $113^{\circ} 40'$  *E.*), the southern extreme of Chuen pi island, is an almost isolated peak situated at  $1\frac{3}{4}$  miles north-north-eastward of Sam pan chau and double that distance from Lankit, on about the same bearing. On Tower hill, the

*General charts 2562, 3026, 2661a and b.*

*Charts 1741, Canton river, sheet 2; also 3588. Var. nil.*

north-western point of the island, is a signal station, with Chuen pi fort under it.

**Pratt rock**, which dries 11 feet (and therefore should be about 3 feet high), lies midway between the two points, and nearly a quarter of a mile off-shore, with deep water fairly close to.

A small bay with a sandy beach lies on each side of Chuen pi point, and fresh water may be obtained in that on the eastern side.

There is anchorage in about 6 fathoms, about 3 cables south-westward of the point.

**Tides.**—It is high water, full and change, at Chuen pi point at 0h. 0m.; springs rise  $7\frac{3}{4}$  feet.

**Junk creek.**—The entrance to this creek is between Chuen pi fort and Anung hoi island, the deepest water, about  $1\frac{1}{2}$  fathoms, being near the fort, shallow banks extending from Anung hoi to within 3 cables of the fort. About 4 miles up is the town or city of Taiping. The creek affords shelter for junks above Junk island and Pritchard rock.

Anung peak, the west extreme of Anung hoi, is 576 feet in height; southward of it, on Anung point, is a fort with flagstaff, with deep water close to the rocky shelf, which extends a short distance off it.

Anung hoi creek lies close north-westward of the island, Fleming point, the south extreme of Senhouse island, being the north point of its entrance; it is available for small junks.

**Western shore** (*continued from page 443*).—**Bower point** is the south-eastern extreme of Tai kok tau, and from it southward towards Sam pan chau, a flat extends  $1\frac{1}{2}$  miles. East Au chau, a small islet, is situated on this shallow flat; West Au chau is included in the reclaimed land.

**ISLANDS IN FAIRWAY.**—**Wantong islands.**—North and South Wantong are two small islands lying north-north-west and south-south-east 4 cables apart, nearly in mid-channel abreast Anung hoi point, separating Boca Tigris from Bremer channel. They are surrounded by a bank which also extends  $1\frac{1}{2}$  miles south-eastward of the southern island, at which distance the depth is only 3 fathoms. The islands are strongly fortified, and with that on Anung hoi abreast are or were known as the Bogue forts.

**Chain rock**, above water, lies about a quarter of a mile east-south-east of North Wantong, and is foul to a short distance off its north-east side.

**LIGHT.**—From a red brick tower, 36 feet in height, erected on Chain rock, is exhibited, at an elevation of 33 feet above high water, a *fixed red light*, visible from a distance of about 10 miles.

*General charts 2562, 3026, 2661a and b.*

*Charts 1741, Canton river, sheet 2; also 3588. Var. nil.*

**Directions.—Anchorage.**—The Boca Tigris is straight, and no directions are necessary for a steam vessel other than to keep the fairway. Although the passage between it and Anung hoi point is somewhat narrow for working a large vessel, it is practicable to back and fill through with the tidal stream. Vessels generally keep near the north-eastern shore in passing, the tidal streams running strongly in eddies. If detained here by the Chinese authorities, the best position to anchor is about a quarter of a mile northward of North Wantong in 7 to 8 fathoms, giving a berth to the flat which extends  $1\frac{1}{2}$  cables northward of the island.

**Bremer channel**, westward of the Wantong islands, has a least depth of about 4 fathoms, over the ridge, which connects the Wantong islands with Tai kok tau, south-east of the fort of that name. It is probably only used by junks to cheat the tide.

**Adventure bank**, with one fathom least water, lies on the west side of its northern entrance, within the 5-fathoms contour, extending south-east of Blenheim point.

*Charts 1741, 1740.*

**Duff rock** (Lat.  $22^{\circ} 48\frac{1}{2}'$  N., Long.  $113^{\circ} 36'$  E.), a pinnacle with 3 fathoms water, is situated on a bank about 6 cables in length within a depth of 5 fathoms; it lies near the fairway of the main channel,  $332^{\circ}$  true, distant  $9\frac{1}{2}$  cables from the north extreme of North Wantong island. Chain rock lighthouse, bearing southward of  $152^{\circ}$  true, leads eastward of it.

**Tiger island**, or Tai fu, the northern end of which is a remarkable mass of rounded granite with precipitous sides, is 572 feet high, and its summit appears cleft. From Tiger's Claw, the south-eastern extreme of the island, a flat extends 2 cables off.

Above Tiger island the river banks become more clearly defined, and assume the character of alluvial flats for many miles.

*Chart 1740, Canton river, sheet 3.*

**Bate rock**, 2 cables northward of the northern side of Tiger island, has 14 feet water, is steep-to, with 10 fathoms, mud, close eastward. The whole of North Wantong open of Tiger island leads north-eastward of the rock.

**Tauling island**, on the eastern side of the fairway, and  $1\frac{1}{4}$  miles north-eastward of Tiger island, is covered with trees. Tauling flat extends southward and westward from the southern part of the island, and leaves a deep water fairway channel about 4 cables wide between it and Tiger island. Both Tauling island and flat are reported to be

*General charts 3588, 2562.*

*Chart 1740, Canton river, sheet 3. Var. nil.*

extending; the depths of 5 fathoms and above, abreast Bate rock, extend over a breadth of 3 cables.

Sailing vessels of large draught turning to windward from Boca Tigris should back and fill between Tiger island and Tauling flat as the tidal streams are strong.

**Sawshi channel** (*Lat. 22° 53' N., Long. 113° 35' E.*).—Within Tauling island are Maitland, Bouchier, Dundas, and Staunton islands, and between the latter and Blake point lighthouse, at the south extreme of Parker island, is Sawshi channel, which leads to Tung kun town and East river, described on page 478.

**Calcutta shoal**, situated near the centre of Small bar, a bank one mile in length, with depths of 2 to 3 fathoms, hard ground, lying in mid-channel, has a depth of 10 feet at low water springs. From the shoal Blake point lighthouse bears 88° true, distant 6½ cables. This shoal is said to be extending southwards. To avoid it pass within 3 cables of the eastern shore.

Northward of Calcutta shoal, up to Second bar, the western shore is foul to the distance of a quarter of a mile, and the 3-fathoms contour is half a mile off in places; the eastern shore is fairly clear beyond the distance of 2 cables.

**LIGHTS.—Blake point.**—A *white group occulting light*, occulted *four times every thirty seconds*, thus:—light, *sixteen seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*, is exhibited from a white mast erected on Blake point, south extreme of Parker island, and entrance to Sawshi channel. The light is elevated 40 feet, and should be visible from a distance of 10 miles.

**Amherst point.**—A *red fixed light*, elevated 40 feet, and visible from a distance of 7 miles, is exhibited from a white mast erected on Amherst point, west side of Parker island, and 3 miles above Blake point.

**SECOND BAR** (*Lat. 22° 58' N., Long. 113° 33' E.*) is the south extreme of a collection of shoals, 3 miles in length, lying off and above Second bar creek, and stretching right across the channel; the patches on it near the fairway have not less than 10 feet at low water springs, which is but little less than will be met with in the fairways of the barriers higher up; the general depths, avoiding these, are not less than 13 feet. The shallow patches are mentioned below, but the chart affords a much less confused idea of the bar, and it has probably much altered since the survey. It is stated that a vessel of 23 feet draught can cross this bar at high water in charge of a good

*General charts 3588, 2562.*

*Chart 1740, Canton river, sheet 3. Var. nil.*

pilot, who will know the best channel, which seems to vary. No permanent directions can be offered for it. See page 463.

**Patches.**—The following rocks and shallow patches lie in or near the fairway over the bar:—

Patches of  $1\frac{3}{4}$  and  $1\frac{5}{8}$  fathoms lie  $3\frac{1}{2}$  cables off the eastern shore, about 6 cables,  $208^\circ$  true, of Malcolm point.

A rock with  $1\frac{1}{4}$  fathoms water lies 2 cables westward of Malcolm point.

Wang lan rock, with  $1\frac{1}{2}$  fathoms, lies  $2\frac{1}{2}$  cables from the east bank of the river, at 4 cables north-westward of Malcolm point; and two patches with  $10\frac{1}{2}$  and 11 feet lie within 2 cables west-south-westward of this rock; a patch of  $1\frac{5}{8}$  fathoms at 8 cables south-westward of Wang lan.

Tai tub rock, with 2 fathoms at low water, lies nearly a cable north-north-east of Wang lan, Second bar pagoda bearing  $291^\circ$  true.

Tai kweichan rock, with  $1\frac{3}{4}$  fathoms, lies  $2\frac{1}{2}$  cables from the shore and the same distance northward of Wang lan.

**Second bar creek**, the entrance to which is situated between Pottinger island and Parker island, joins East river at Cha ko; the navigation presents no difficulty for small vessels, but a shallow bar exists off an island about 3 miles within the entrance, and there is a rock in mid-stream at Cha ko bend, the channel lying close to the west bank.

*Chart 1742, Canton river, sheet 4.*

**Second bar pagoda**, with a fort close north of it, are conspicuous objects on the western shore when approaching Second bar.

**ABOVE SECOND BAR.—Dangers.**—Sai sheklung rock (*Lat.  $23^\circ 1' N.$ , Long.  $113^\circ 32\frac{1}{2}' E.$* ) is 150 feet in length, with a least depth of 9 feet; it lies  $1\frac{1}{2}$  cables off the eastern bank at 8 cables southward of Tseki creek, Pottinger island. Fishing stakes are placed on and beyond this rock from November to March yearly.

Tai sheklung rock, about 150 feet in extent, with a least depth of 11 feet, lies near the fairway,  $309^\circ$  true,  $3\frac{1}{2}$  cables from Sai sheklung, and nearly 3 cables from the east bank.

The shallow water off the entrance to Escape creek was (1877) reported to be extending westward.

**Escape creek.—East river** (*Lat.  $23^\circ 3' N.$ , Long.  $113^\circ 32' E.$* ).—Escape creek is the southern entrance to East river, which extends a considerable distance north-eastward, and is of some importance; it lies between Artillery and Davis islands, and its northern entrance is northward of Davis island. It is described on page 478, with the inland waterways of the delta of Canton river.

*General charts 3588, 2562.*

*Chart 1742, Canton river, sheet 4. Var. nil.*

**Belcher reach.—Light.—Tide gauge** (*Lat. 23° 2½' N., Long. 113° 31' E.*).—On the west bank of the river in Belcher reach, opposite Davis island, is a beacon, surmounted by a ball and painted black and white, on which is a tide gauge, showing the height of the tide above low water springs.

A *red fixed* light, elevated 40 feet, is exhibited from a white mast on a hut, near the tide pole beacon, visible about 4 miles.

**CHANNELS TO CANTON CITY.**—Above Belcher reach the river is divided by Danes island and the Flat islands eastward of it, into two main branches, Whampoa channel, described below, and Blenheim passage on page 458; these meet again at Honan point, just above the city of Canton.

By the southern or Blenheim passage, and the deeper; the distance to Honan point from the junction is about 17 miles, and by the northern or Whampoa channel about 14 miles.

Canton lies on the latter, below Honan point, and 8 miles below the city is Whampoa.

**Navigability.**—*See* pages 447, 458.

**WHAMPOA CHANNEL.**—The channels between the Flat islands and that between No. 4 Flat island and Danes island are shallow and not used by foreign vessels, the navigable passage into the northern or Whampoa channel being immediately westward of First bar island, between it and No. 1 Flat island, with not less than 20 feet water at low water springs. Vessels of 23 feet draught can reach Whampoa; *see* also page 447.

**First bar island**, low and flat, lies about 2 miles above Belcher reach light-beacon, off the left or north bank of the river; westward of it are the Flat islands, four in number (numbered 1 to 4) from the eastward, smaller but similar to First Bar island, and then the larger Danes island, the western part of which is hilly ground, marking the position of Whampoa, which is situated on its northern side.

**A spit**, with less than 3 fathoms, extends 3 cables south-eastward of the reclaimed land at the eastern end of No. 1 Flat island, forming the west side of entrance to Whampoa channel; the white mast which carries the light is a useful mark for avoiding it.

**LIGHT.**—From a hut with a mast, painted white, erected on the west side of First bar island, about 2 cables from its north-west extreme, is exhibited, at a height of 40 feet, a *group occulting white* light *every sixteen seconds*, showing thus:—light, *ten seconds*; eclipse, *two seconds*; light, *two seconds*; eclipse, *two seconds*. It is visible from a distance of 10 miles in clear weather, and is a useful mark for entering Whampoa channel.

*General charts 3588, 2562.*

*Chart 1742, Canton river; sheet 4. Var. nil.*

**FIRST BAR**, nearly half a mile above First bar island, lies between a shallow sandbank, extending north-westward of First bar island, and the spit extending northward from No. 1 Flat island. There is not a less depth than 20 feet in the fairway.

**Brunswick patches**, with depths of 11 to 12 feet, lie about two-thirds of a mile above the western end of First bar island, on the north bank of the river.

There are channels between the patches and southward of them, but the narrow channel northward of the patches, and close along the north or left bank, is generally used. North shore pagoda, in line with the bluff point inside Louisa island, 295° true, leads southward of the patches, but over 15 feet at low water on the edge of the bank off No. 1 Flat island.

**Cambridge reach**.—Above Brunswick patches, Cambridge reach, which leads to Whampoa, is clear, with about 22 feet least water, excepting a shelf that extends northward from the Flat islands, with only 18 feet on its edge in mid-channel, and the barrier below mentioned.

**Cambridge barrier**.—**Light-beacons**.—The barrier in Cambridge reach extends from the western extreme of No. 3 Flat island across the river. There are two passages through the barrier, the southern for steamers, the northern for junks, each having a red spar carrying a *red* light at night on the northern side, and a black spar carrying a *green* light at night on the southern side. The steamer channel is 440 feet wide, with a depth of 16 feet at low water springs.

A **telegraph cable** crosses the river from about mid-way between Watson and Louisa islands to a little eastward of Bamboo town. Its direction is marked by two pole beacons on each bank; those nearest the river have boards, with the words telegraph cable on them. Vessels should not anchor here.

*Charts 1742, 3646.*

**WHAMPOA** (*Lat. 23° 5½' N., Long. 113° 25' E.*).—Whampoa is situated on the northern side of Danes island, south side of the river. At its eastern extreme is a jetty fronting some buildings formerly known as Chang chau town, and to foreigners as Bamboo town.

Further westward lies the Chinese Government military and naval establishments with small docks and workshops. Fronting these is English reach, and above it, extending south-westward, is American reach. Opposite is Sulphur point, formed by the confluence of Elliot passage, of which American reach is a part, and Junk creek.

Sanchau town extends from Sulphur point along the north bank of American reach.

*General charts 3588, 2562.*



*Charts 1742, 3646. Var. nil.*

**The anchorage** is in English and American reaches, in from  $4\frac{1}{2}$  to 7 fathoms, soft mud; it is safe, with a moderate tidal stream; there is not, however, room for two large vessels to moor abreast.

It is included between an imaginary line drawn from the north-western point of No. 3 Flat island to a mound on the eastern end of Louisa island, for the eastern or lower limit; and a similar line drawn from Gully point to a creek on the northern side of American reach, and from Sulphur point in a  $67^\circ$  true direction to the northern bank of the main river, for the western or upper limit.

See Regulations with regard to berthing and explosives, under Canton (Shamien) anchorage, page 457; and the China Coasters' Manual for full details.

**French river**, between Danes island and French island, connects American reach with Collinson reach, and is much frequented by steam launches, which at the southern end use the channel between Powder island and French island, in which there is a depth of 7 feet at low water. A village is situated on the western side of this channel at three-quarters of a mile north of Calliope point.

**Tides.**—At Whampoa the tides are effected by diurnal inequality; the following table (shown also in the title of *Chart 3646*) gives the average time and rise at high water, full and change, for each month.

Month.	Time of H.W., F. and C.		Average rise, spring tides.	
	Day.	Night.	Day.	Night.
	p.m. 2h. 30m.	a.m. 1h. 10m.	feet.	feet.
January - - - - -	2-35	1-40	$6\frac{1}{2}$	$8\frac{1}{2}$
February - - - - -	2-25	1-30	7	8
March - - - - -	1-45	1-15	$7\frac{1}{2}$	8
April - - - - -	1-10	1-10	9	8
May - - - - -	1-00	1-10	$9\frac{1}{2}$	8
June - - - - -	1-00	1-10	9	7
July - - - - -	0-50	1-50	9	$7\frac{1}{2}$
August - - - - -	1-15	1-55	$8\frac{1}{2}$	$7\frac{1}{2}$
September - - - - -	1-25	1-30	8	8
October - - - - -	1-40	1-25	8	$8\frac{1}{2}$
November - - - - -	2-00	1-20	7	9
December - - - - -				

There is a tide gauge at Whampoa custom house showing the depth of water off Sulphur point (not shown on charts).

*Charts 3646, 3647.*

**CHANNEL.—Whampoa to Canton.**—The lower part of the city of Canton is 8 miles, and the Shamien or foreign concession 10 miles, above Whampoa.

*General charts 3588, 2562.*

*Chart 3646, Whampoa to Canton, sheet 1. Var. nil.*

**Rocks in Junk creek and Whampoa channel.**—A rock which dries lies in the channel of Junk creek, abreast the north-western part of Pedder island, as charted.

Pedder and Green islands are cultivated; Green island has small trees, and is more conspicuous than Pedder island.

A pinnacle rock, with 8 feet water, lies in the channel abreast the south-east extreme of Green island.

Pa chau kok rock, about 40 feet square, with a depth of 8 to 9 feet, lies about 150 yards from the right bank of the river off the creek eastward of Pa chau kok or Whampoa small pagoda.

Hankau rock, about 140 feet east and west, with a breadth of 40 feet, has a depth of 8 feet over it, and lies about 250 yards from the right bank of the river, with Pa chau kok or Whampoa small pagoda bearing  $128^{\circ}$  true,  $2\frac{1}{2}$  cables.

A bank over 3 cables in length, with 5 feet water, lies northward of Hankau rock.

Powan rock, about 50 feet in extent, with a least depth of 8 feet, lies 180 yards from the left bank of the river, nearly 7 cables above Symons island.

A rock, about 20 feet in area, with 7 feet at low water, lies in the fairway at  $1\frac{2}{10}$  miles westward of Powan rock; and there are other patches of same or less depth in the channel, as charted.

*Chart 3647, Whampoa to Canton, sheet 2.*

**Whampoa barrier.**—**Lights** (*Lat.*  $23^{\circ}7'N.$ , *Long.*  $113^{\circ}20\frac{1}{2}'E.$ ). Whampoa old barrier, just below New island, is under water; a new barrier of piles, just above water, with an opening for the passage of vessels, exists just westward of the old barrier. The opening is 400 feet wide, with a least depth of 9 feet at low water, spring tides.

A *fixed red* light is shown from a spar beacon surmounted by a shape on the northern side, and a *fixed green* light from a spar beacon surmounted by a shape on the southern side of the steamer passage through the barrier, near the southern shore. A *fixed red* light is also shown from a spar beacon with shape on the western edge of the 3-foot bank, eastward of the barrier *red* light.

**Fiddlers reach** is situated between Whampoa island and Honan island, its northern entrance being abreast Whampoa barrier, and its southern in American reach. A long narrow, grassy island, from one to 2 feet high, has formed in this reach at about  $2\frac{1}{2}$  miles westward of Hall point at the southern end, and also a smaller grassy island, awash at high water, at half a mile south of Hauqua point at the northern end.

**Reef.**—A reef, with 5 feet over its outer edge, and less water inshore, projects about a cable from the eastern side of the entrance to

*General charts 1739, 3588, 2562.*

*Chart 3647, Whampoa to Canton, sheet 2.*

a creek on the right bank of Whampoa channel, and about 7 cables above the fort on the eastern end of Napier island.

*Chart 3620, Canton harbour.*

**Dutch Folly pass.—Lights and beacons.**—On the sunken rocks south-westward of Dutch Folly are three round beacons. Nos. 1 and 2, marking the northern side of the channel, are of stone, painted red, 26 feet in height from base to vane, and each is surmounted by a lantern from which is exhibited, at 15 feet above high water, a *fixed red* light, visible from a distance of one mile in clear weather.

No. 3, on the southern side, is of brick and stone, painted black, 22 feet in height from base to vane, and from it is exhibited at 15 feet above high water, a *fixed green* light, which is visible from a distance of one mile.

**Light-buoys.**—A red conical buoy, carrying a *red* light at night, marks the northern side of the channel to Canton anchorage, and a black buoy on which is a *green* light the southern side, about  $1\frac{3}{4}$  cables above the beacons.

**Shamien rock**, with 12 feet water, lies about  $1\frac{1}{2}$  cables south-westward of the western end of the Shamien bund.

A red and black chequered conical buoy, carrying a *fixed red* light at night, is moored in 12 feet on the south-eastern side of the rock.

**Fati rock**, with 8 feet water, lies about a cable southward of Shamien rock, and is marked on its south-eastern edge by a red and black chequered conical buoy, carrying a *red* light at night.

**Wongsha rock**, above Shamien rock, and situated  $3\frac{1}{10}$  cables,  $344^{\circ}$  true, from Oliver point, is marked on its north-east side by a black conical buoy exhibiting a *green* light.

Vessels should pass eastward of these buoys.

*Chart 3646, Whampoa to Canton, sheet 1.*

**Directions.**—If proceeding from off Whampoa city by Junk creek and Whampoa channels, it is better to take a pilot, although the charts are a sufficient guide for vessels of light draught if it can be ascertained that no important changes have occurred in the channels.

A vessel of a draught of 11 feet is about the limit that could go to Canton by these channels, which are stated to be shoaling.

*Chart 3647, Whampoa to Canton, sheet 2.*

Caution is required when passing Whampoa barrier if the tidal stream is strong, when hug the right bank at the mouth of Fiddlers reach.

To pass the Salt flats in Front reach, southward of the western part of Napier island, in a depth of 11 feet, the gauge at Whampoa custom house must show  $12\frac{1}{2}$  feet, and it must be within one hour of high water. Just above the Salt flats a reef, with less than 6 feet water,

*General charts 1739, 3588, 2562.*

*Chart 3620, Canton harbour.*

extends a distance of 150 yards into the river from the right bank, abreast the west extreme of Kuper island; a vessel should be in mid-river when passing it. Midway between this reef and the west end of Napier island is a rock with 6 feet water, lying in the fairway, in the position charted.

**ABOVE DUTCH FOLLY.**—The rocky ground above Dutch Folly, a small island with a fort on it, abreast the centre of the city, is buoyed and lighted, as mentioned on page 456.

**Canton or Shamien anchorage.**—Off Shamien, the foreign settlement westward of the City of Canton, at the junction of the southern approach, by Blenheim passage and Back reach, the river is broad, forming a commodious anchorage for steam vessels, the deepest water, 18 to 22 feet and good holding ground, being within 150 yards of the river wall of Shamien; sailing vessels are restricted to Whampoa anchorage.

Shamien anchorage is sometimes very crowded, at which times steam vessels can anchor below or southward of Honan spit.

**Anchorage limits.**—The anchorage has the following boundaries:—

On the south: An imaginary line drawn  $90^{\circ}$  true and  $270^{\circ}$  true, through the centre of Macao fort, in Back reach, the southern approach.

On the west: A similar line drawn  $246^{\circ}$  true from the five-storied pagoda, across the river on both sides of Belcher island.

On the east: A line drawn from a small pier situated about 700 feet eastward from the west extreme of Kuper island, in a  $206^{\circ}$  true direction to the west side of a creek in Honan island, Whampoa channel. (*Chart 3647.*)

Vessels entering Canton and Whampoa anchorages are boarded by the berthing officer, who will direct them to proper berths, and they must moor in accordance with the orders received from the Harbour Master.

Steam launches anchor eastward of an imaginary line joining the red buoy on Honan spit to Bird's Nest buoy.

Vessels are required to exhibit lights as laid down in the Regulations for preventing collisions at sea.

No vessels except men-of-war may use swinging booms; these shall be rigged in from sunset until sunrise.

**EXPLOSIVES.—QUARANTINE.**—Vessels with cargoes of explosives shall fly a red flag, and shall anchor below Macao fort at Canton, or at a distance of not less than a mile outside the lower harbour limit at Whampoa. Those with inflammable goods are berthed in a special anchorage, which at present is between Bird's Nest rock and Macao fort at Canton, and outside the lower harbour limits at Wham-

*General charts 1738, 3588, 2562.*

*Chart 3620, Canton harbour. Var. nil.*

poa. A vessel arriving with contagious disease on board must not come nearer than the lower limits of the anchorages, shall fly a yellow flag at the fore, and not allow anyone to disembark or come on board without permission of the Harbour authorities.

**Port regulations.**—Masters of vessels on arrival should obtain a copy of the Port Regulations from the Harbour authorities. These will also be found in the China Coasters' Manual, published annually.

**Mooring buoys.**—Two mooring buoys for the use of the river gunboats have been placed opposite the British consulate; there is a depth of 7 feet at these buoys.

Eastward of these moorings are those established for the use of the French navy.

Two mooring buoys for the use of vessels of the United States navy have been placed at the upper end of Shamien island, in 19 feet of water.

Between the British and American mooring buoys are established two rows of buoys for the use of coasting steam vessels.

**Tide gauge.**—A tide gauge, showing the height of tide above low water springs, has been established on the river wall close to the landing steps, at about 350 yards eastward of the English church at Shamien.

To find the depth on Honan spit, add 10 feet to the depth shown by this gauge.

**General directions** for reaching Canton by Blenheim passage and Back reach will be found on page 462, and in the following description of those passages.

*Chart 1742, Canton river, sheet 4.*

**BLENHEIM PASSAGE to CANTON.**—Above **First bar island.**—The Blenheim or southern passage to Canton, through Blenheim, Collinson, and Kellett reaches, &c., southward of Danes and French islands, which must be used by vessels proceeding to Canton drawing over 11 feet water; vessels of 21 feet draught ascend to the anchorage below Hamilton creek, just below the Tai shek barrier, below mentioned, and 6 miles below the city, and it is generally considered that vessels drawing  $17\frac{1}{2}$  feet can proceed to Canton, but that there will be a sufficient depth for such vessels at high water on Tai shek barrier, Parker point bar, or Honan spit, cannot be relied on. There are tide gauges near these places showing the height above low water springs.

**Collinson barrier** (*Lat.  $23^{\circ} 5' N.$ , Long.  $113^{\circ} 27' E.$* ).—The iron barrier which separates Blenheim and Collinson reaches extends from No. 3 Flat island at nearly half a mile from the eastern end, southward across the river; it has two openings in it, the northern

*General charts 1739, 3588, 2562.*

*Chart 1742, Canton river, sheet 4. Var. nil.*

for steam vessels and the southern for junks. The old wooden barrier has been removed to a depth of 16 feet.

**Lights.**—The northern opening is 570 feet wide, with a least depth of 16 feet; the light on the north side is a *group occulting red* light, showing two short eclipses in quick succession, exhibited from a white hut surmounted by a bell; that on the south side is a *green fixed* light.

**Fog signal.**—During thick or foggy weather a bell on the white hut is sounded once *every six seconds*.

*Chart 3646, Whampoa to Canton, sheet 1.*

**Sin nanzing rock**, small, and with 10 feet at low water, lies nearly in mid-channel in Collinson reach eastward of Rippon point, about a cable from the northern shore.

**Fishing stakes.**—A bank, which uncovers, extends for a short distance in a north-easterly direction from Calliope point, above Collinson reach on left bank. Fishing stakes are established off it every winter, extending from it to mid-channel.

**Light-buoy.**—**Junk rock**, lying half a cable off the eastern shore of the river, about  $1\frac{1}{2}$  cables below Larkins point, in Kellett reach, is marked by a black conical buoy, on its north-western side, which shows a *fixed green* light at night.

**High island**, 88 feet high, with shallow water extending half a mile eastward of it, lies in the middle of the river, the northern channel only being used. Comus rock, under water, at 60 yards from the north shore, and  $1\frac{1}{4}$  cables eastward of the northern point of High island, narrows this channel.

**Light-beacons.**—On the northern point of High island is a white quadrangular open-work beacon, from which is exhibited, at 14 feet above high water, a *fixed green* light visible one mile. A white hut close to the beacon is conspicuous.

A *fixed red* light is exhibited from a red beacon surmounted by a red disc, on Comus rock.

**Brown reach**, above High island, has a depth of 20 to 26 feet. Above Galbraith point on the south shore of Brown reach the river splits round the low flat island Chang shan.

**Senhouse reach**, the channel southward of Chang shan, formerly unnavigable, had a depth of 9 feet in 1908.

*General charts 3588, 2562.*

*Chart 3647, Whampoa to Canton, sheet 2. Var. nil.*

**Maitland passage**, the northern channel, carries fairly deep water as far as the short cut which connects it with Elliot passage; then the depth decreases to 13 feet (20 to 21 feet at high water springs), on either side a narrow middle ground of 10 feet, as charted.

**Hamilton creek** (*Lat. 23° 2' N., Long. 113° 19' E.*).—The river abreast is broad and deep, and affords excellent anchorage, from the next hilly ground on the southern shore above Maitland passage, to Hamilton creek. Vessels above 17½ feet draught cannot usually go above this.

**Tide gauge**.—A spar beacon similar to the barrier beacons, and showing the depth of water on Tai shek barrier just above, stands on the northern shore of the river nearly opposite Hamilton creek.

**Tai shek barrier** is an artificial obstruction of stones and piling constructed to prevent the approach of large vessels to Canton. The channel through it on the northern shore of the river has been widened to 400 feet, and has a depth of 12 feet on its northern side, decreasing to 10 feet on its southern side at low water springs, by latest report. Taking the mean 11 feet, there would be about 18½ feet at high water springs; the tide gauge above mentioned will show the depth in the channel. The depths up to Hamilton point, about 6 cables above the bar, are apparently no better than the barrier channel, but the chart, probably, is not correct. There is said to be another tide gauge above the bar.

**Lights.—Buoy**.—Two spar beacons each 46 feet high, painted red, white, and red, horizontally, and surmounted by a circular shape, mark the northern side of the passage; from each is exhibited a *fixed red* light, visible one mile in clear weather.

The south side is marked by a black conical buoy, exhibiting a *fixed green* light.

**PARKER POINT BAR** is situated at the crossing from the southern branch of the river into that from Canton, of which Elliot passage is the continuation eastward. It is shallow in consequence of being out of the scour of the streams of either branch. The chart shows a depth of 9 feet at low water springs in the fairway between the spits extending from Parker and Tai mei points, but the latest account gives 10½ feet. Vessels of 17½ feet draught have passed over after examining the bar and buoying the channel.

**Tai mei beacon light**.—On a rock in the fairway between Parker point and Tai mei (49th) point, is a spar beacon, 27 feet high, painted black, white, and black, horizontally, and surmounted by a rectangular frame. From it is exhibited, at 21 feet above high water, a *fixed green* light, visible one mile.

*General charts 1742, 1739, 3588, 2562.*

*Chart 3647, Whampoa to Canton, sheet 2. Var. nil.*

The channel is between the beacon and Parker point.

**Tide gauge.**—A tide gauge is attached to the beacon, showing the depth above low water springs.

**Macao fort passage** is the reach leading from Parker point bar to Shamien, Canton. Macao fort (*Lat. 23°4½'N., Long. 115°15'E.*) is on an islet in the reach, and Macao fort rock lies about a cable north-eastward of it.

**Light-buoys.**—Macao rock, with 8 feet water, is marked by a black conical buoy on its north-east side, and from it is exhibited a *fixed green light*.

Haeshin rock lies about 250 feet eastward of Macao fort rock, and it is marked by a conical red buoy, with a *fixed red light*, moored in 10 feet at low water on its south-western side.

Pak hin hok, a rock with 6 feet water, bearing 174° true 1½ cables from Butterford and Swire wharf, is marked by a similar light-buoy.

Vessels pass between Macao rock and Haeshin rock buoys.

*Chart 3620, Canton harbour.*

Bird's Nest rocks, abreast Bird's Nest fort, and 130 yards from the eastern shore of the river, are two sunken rocks close together; they are marked by a red conical buoy, which exhibits a *fixed red light* at night, moored in 13 feet at low water on their western side.

**The ebb stream** in Macao fort passage runs 3 to 4 knots an hour at times.

**Honan spit** extends nearly across Canton harbour from the west extreme of Honan island; the chart shows a low water depth of 10 to 11 feet; but the depth at any time will be known by adding 10 feet to that shown on the Shamien gauge, page 458.

**Buoy.**—A red spar buoy is moored on Honan spit at 2 cables 253° true from the Customs signal station on Honan island.

**Canton or Shamien anchorage** and regulations, &c., see page 457, and Canton city, page 464.

**Elliot passage** is an intermediate branch of the river leading to Whampoa from Canton and the direct continuation of Macao fort passage. It was a fine, deep water channel, but the bed of the river has silted up for one mile on either side of the barrier crossing it from the western end of Bethune island, and it is uncertain what depth there is now in the barrier channel. The eastern end of Elliot passage leads into American reach, Whampoa anchorage.

The opening from Elliot passage, between Dent point of French island and Melgrund point of Haddington island, is said to have a tortuous channel, with 10 feet at low water; there are numerous fishing stakes in its north entrance. (*Chart 3647.*)

**Honan and Actæon islands**, together about 8 miles in length, form the north side of Elliot passage throughout; the north-east side of Honan is separated from Whampoa island by Fiddlers

*General charts 1739, 3588, 2562.*



*Chart 3620, Canton harbour. Var. nil.*

reach; and the north side of Honan forms the south side of Front reach, the channel from Whampoa anchorage to Canton. Honan spit, at its west extreme, is referred to on page 461.

**GENERAL DIRECTIONS.—Hong Kong to Belcher reach and to Canton by Blenheim passage.**—These general directions are a summary of the detailed descriptions of the dangers and channels given in the preceding pages, and are meant as a rough guide to the route followed from Hong Kong, and as a check on the pilot. The general charts quoted at the bottom are the most useful for tracing the route. The route from sea to Urmston road and Lintin island will be found under Lema and Lantau channels, &c., on pages 445, 446.

There is no information on tugs, other than at Canton. Steam launches are available for towing native craft.

The channels above Lintin island are said to have much changed, so that the charts cannot altogether be depended on.

The river is navigable at night by vessels in charge of a pilot.

Light-draught vessels, on leaving Hong Kong harbour, proceed by Kap sing mun (*Plan 3632*) (*see* page 485), northward of the Brothers, through Tong ku harbour or Urmston road. From about half a mile off Black point (*Chart 3026*), steer to pass about half a mile westward of Ma chau; Syah islet must not be opened of Ma chau until south-west point of Nam tau bears about  $101^{\circ}$  true, when it must be opened westward of Ma chau to clear Ma chau spit. When Ma chau is abeam steer about  $326^{\circ}$  true, passing through Fan si ak channel, westward of the fishing stakes, to Chuen pi channel, observing that the eastern end of Tiger island, well open eastward of Sam pan chau, leads eastward of Lintin bar. (*Chart 3026.*)

Give a sufficient berth to Pratt rock in Chuen pi channel (*Chart 1741*), pass through Boca Tigris and eastward of Duff rock, then close Tiger island to avoid Tauling flat, and having passed eastward of Bate rock (*Chart 1740*) steer to pass 3 cables westward of Tauling island, and about 2 cables off Blake point lighthouse, heading for the conspicuous clump of trees on the northern side of the creek beyond Blake point, and keep this distance off the eastern shore for three-quarters of a mile northward of the point, when increase the distance to 4 cables.

When the trees on Malcolm point, the northern point of Second bar creek, open clear of the land southward of it, steer towards the point, and thence follow Pottinger island bank at about  $1\frac{1}{2}$  cables distant, avoiding the rocks and shoal patches on Second bar referred to on pages 450, 451.

This may lead through what is known as Eastern channel of Second bar, eastward of Wang lan rock of 9 feet, in about 12 feet at low water, but owing to changes in the channel referred to on the page above quoted, it should not be attempted without the assistance of a pilot

*General charts 1180, 3026, 2662.*

*Chart 3620, Canton harbour. Var. nil.*

unless the tide has risen enough to take the vessel over the shallow heads in or near the passage.

(From the latest information, 31st December, 1911, H.M.S. *Clio* crossed the bar at the first hour of the flood (neap tides) in a least depth of 21 feet, on the old leading mark for the western channel, namely, the western extreme of Tiger island in line with Grassy tongue (abreast Calcutta shoal) bearing 168° true, astern. *Chart 3588*. The Remark book of that vessel states that the western channel is now very little used, but appears to have washed away considerably.)

When Nimrod creek, on the western shore, opens (*Chart 1742*), the vessel will be close to Sai Sheklung (which is marked by a row of fishing stakes extending from Pottinger island), then, giving a berth to Tai sheklung, steer across to pass  $1\frac{1}{2}$  cables from the Tide-scale beacon (with *red* light), western side of Belcher reach, thence through Belcher reach and Blenheim reach to Collinson barrier.

Pass through the northern opening in Collinson barrier (at night, between the *red group occulting* light on the north side and *green fixed* light on the south side), and thence south-eastward of Sin nanzing rock, and westward of Junk rock buoy.

Round Bremer point (*Chart 3646*), thence passing between Comus rock and High island light-beacons into Brown reach.

Continue through Brown reach and Maitland passage (*Chart 3647*), cross the northern part of Tai shek barrier, which, in other than small craft, should be reached at the time of high water, between the red and white beacons (with *red* lights) on the north side, and the black buoy (with *green* light) on the south side; thence through Back reach, and across Parker point bar, between the ledge off the point and Tai mai (black, white, and red) beacon, with *green* light at night. Thence keep in about mid-channel to Macao fort islet, and passing between Macao fort rock and Haeshin rock buoys (*green* and *red* lights, respectively, at night). Again keep in mid-channel to Shamien anchorage, passing westward of Pak hin hok and Bird's Nest rocks buoys (*red* lights); thence over Honan spit if proceeding to the Shamien anchorage, eastward of Fati rock and Shamien rock *red* light-buoys. (The last two red light-buoys mark the starboard side of the channel when approaching from Whampoa). Honan spit, according to the chart, has about 11 feet in the fairway, which is about the same as Tai shek barrier, through which the vessel has come.

The depth shown on the Shamien gauge, directly ahead, with 10 feet added, is the depth over Honan spit.

For anchorage and regulations, see pages 457, 458.

**Tides.**—It is high water, full and change, at Kuper island, off Canton, in March at 2h. 40m., in May and June at 1h. 40m., in September and October, 2h. 12m.; springs rise about  $5\frac{1}{2}$  feet, neaps  $4\frac{1}{2}$  feet. From April to October the day tides are sometimes about:

*General charts 1180, 3026, 2562.*

*Chart 3620, Canton harbour. Var. nil.*

2 feet higher than the night tides, but from November to February the day tides are the lower. *See also Whampoa tides, page 454, and China Coasters' Manual.*

**Pilots** for the river can be obtained from the Harbour Master's office at Canton, or from the Pilot service. *See also page 504.*

**Typhoon signals** are the same as for Hong Kong, pages 510, 511, with the exception of the "Urgent signal," which, in this case, is two cones, points together, indicating wind of typhoon force at Hong Kong. They are hoisted at the Customs signal station, Honan.

**CANTON**, Chinese Sheng cheng, the "city of perfection," or Kuang chau fu (the name Canton is a corruption by the Portuguese, the earliest European visitors, of the name of the province Kuangtung, of which it is the capital), a city and seaport, stands on the left bank of the river, about 31 miles above Boca Tigris, about 80 miles from Macao, and the same distance from Hong Kong. It is surrounded by a wall 5 miles in circumference, the foundation of which is of red sandstone and the upper part brick. The wall varies from 25 to 40 feet in height, and is 20 feet thick, having an esplanade on the inside, and is accessible on three sides of the city.

The city is divided into two unequal parts by a partition wall 6 to 8 feet thick, extending east and west, having four gates, and two water gates at its extremities, through which boats pass east and west into and across the new city. The northern and larger division is called the old city, the western part of which is occupied by the Tartar population; the southern division is the new city. The suburbs are to the west, the houses being built close up to the walls. The country northward and eastward of the walls is clear. There are 12 outer gates, each defended by a two-storied guard-house, which commands the wall on either side, the principal ones having an outwork in addition.

A ditch encompasses the wall, and is dry round the northern sides, which are rather elevated; nearer the river the ditch and the canals within the new city and western suburb fill with the tide and empty at low water. In the northern corner of the city stands Magazine or City hill, commanding its interior and the outside surrounding hills on the north; immediately below it is a large square building of red brick, called the five-storied pagoda, on the northern and most elevated angle of the wall. Gough fort is outside the city, on the other side of a ravine about 500 yards north-eastward of this building, and there is a rather lower ridge outside the north-western part of the wall which it commands. The population of the city, according to a Chinese census, 1910, is 654,881, which includes a boat population of 25,973. The river is crowded with vessels and rafts of all kinds. The estimate of the Statistical Secretary to the Chinese Maritime Customs in 1909 was 900,000. The estimated foreign population,

*General charts 2562, 2661a and b.*

*Chart 3620, Canton harbour. Var. nil.*

not included in the above figures, is 1,570, of which about 25 per cent. are of British nationality.

**Shamien** (*Lat. 23° 6½' N., Long. 113° 14½' E.*), the foreign concession, is on the point westward and above the city southward of the western suburbs and facing Macao fort passage or Back reach, as it is sometimes called. Its frontage is of irregular oval form, 2,850 feet in length, its extreme breadth is 950 feet, and it is separated from the mainland by a canal, 100 feet wide, faced with masonry, crossed by three stone bridges, and having a stone embankment on the river side. Of the enclosed area four-fifths at the western end has been appropriated to the British Government, and one-fifth at the eastern end to that of France. All the foreign consuls reside in the British concession.

Besides the Consular offices and the residence of the Vice-Consul, there is a church, library, reading-rooms, &c., and there are two cemeteries within a moderate distance of the concessions. The English church has a tower and cupola.

For the Shamien anchorage, *see* page 457.

**Lights.**—The river front is lighted with electric lights, the landing steps being marked by *red* lights.

**Supplies.**—The markets of Canton are well supplied with provisions at moderate prices; beef, poultry, fish, fruit, and vegetables at all times, to which are added in winter, mutton and game in plenty.

The water is not suitable for drinking purposes.

**Coal.**—From 500 to 700 tons of Japanese coal are usually in stock at Canton. The coal is of inferior quality; the two wharves are 75 and 35 feet in length, with depths of 18 and 10 feet, respectively, alongside. There are coal lighters for coaling from alongside the vessels.

Other supplies for shipping, such as oil, tinned provisions, and water, must be obtained at Hong Kong, a free port.

**Wharves.**—The bunding or embanking of the north bank (of the Pearl river) southward of the city, continues to make good progress. Up to March, 1910, about 2 miles had been completed, thus forming a highway upon which the juiricksha traffic has already appeared, from the Hong Kong steamer wharves, situated to the east of Shamien, to Tai sha tau, the terminus of the Canton-Kowloon railway.

In connection with the bund, a new wharf was recently constructed by a British firm; it is a screw pile structure, projecting 72 feet beyond the bund, with a frontage of 156 feet, with a depth of 22 feet alongside at high water springs.

There are other wharves or piers between the Shamien and above Dutch folly, close to the Custom-house.

Wharves have also been constructed on either side of Macao fort

*General charts 2562, 2661a and b.*

*Chart 3620, Canton harbour. Var. nil.*

passage (Back reach) at the upper end, used by the river steamers, alongside which there is a depth of about 8 feet at low water springs.

The China Navigation Company own wharves at Pak hin hok; vessels approaching these wharves with the object of berthing blow a *long* and *short* blast on the whistle, and by day hoist their distinguishing flag at the fore. Signals will be made from the signal staff at the wharves, directing the vessel's movements. *See China Coasters' Manual* for full details.

**Repairs.**—Small repairs to hull and machinery can be executed, but there is no dock at Canton.

**Hospital.**—There is hospital accommodation at Canton for 10 or 12 seamen.

**Trade.**—The value of the trade at Canton in 1911 was £14,151,275, imports £6,796,540, exports £7,354,735. The principal articles of import are opium, cotton, and woollen goods, metals, flour, nuts, kerosene oil, sugar, and matches; and of exports, glass bangles, matting, silk goods, tea, and tobacco.

In 1911, the port was entered by a total of 3,870 vessels, of the aggregate tonnage of 2,402,709 tons, of which 2,460 vessels, of 1,680,289 tons, were British. Of these, 258 sailing vessels entered, of the aggregate tonnage of 51,224, and 260 cleared.

Of the 71 foreign firms established at Canton, 27 are British, 15 German, and 8 French. The steam launch traffic under the Inland Steam Navigation rules is very considerable.

**Tugs.**—The launches as a rule do not carry cargo, but tow native craft.

**Communication.**—Between Canton and Hong Kong there is a day and night service, carried out by about a dozen high-class steamers.

**Railway.**—The Canton-Kau lung railway, connecting Hong Kong harbour with Canton, was opened in 1911.

A railway connects Canton with Samshui viâ Fat shan and Sainam.

The Canton-Hankau trunk line from Canton, 720 miles in length, strikes the Pe kiang just above Pak kong kiau, about 50 miles above Samshui, whence it runs along the left bank of the Pe kiang through Ying te and Shao chau fu, thence it continues along the left bank of the Ching river to Lo cheng, thence towards the Chiling pass, and to the boundary of the province. It is now open to traffic (1912) as far as Lin kong hou, a station 74 miles from the Canton terminus.

A railway from Canton to Sunning, in three sections, is probably completed; the first was opened in 1909; the second, to Tanshan, is (probably) finished; the third section, from Sunning to Kong mun, was opened in January, 1912.

**Telegraph.**—Canton is connected by telegraph with the important towns.

**Climate.**—Usually the temperature ranges from 42° in winter to  
*General charts 2562, 2661a and b.*

*Chart 3620, Canton harbour. Var. nil.*

96° in summer; the extreme range, which is rarely reached, is from about 35° to 100°; the mean temperature for the year is 73°; for February 58°; and for August 84°. The seasons correspond with the period of the monsoons, the hot season being from May to October, and the cool season from mid-October to the end of April.

South-westerly winds set in early in April, but are not strong until May, when rain becomes abundant, and the thermometer rises to 85°, and even higher. June is dry and sultry, whilst in July and August frequent showers occur almost daily, and with the strong monsoon, temper the extreme heat, which averages 87° to 89°. September is again sultry, but the nights begin to grow cool, and October, though warm, is usually not unpleasant.

The first steady wind of the north-east monsoon, in the early part of November, sending down the temperature to about 55°, brings a sensation of bitter cold to Europeans, enfeebled by the preceding heat; but the weather of the ensuing months, in which constant sunshine, a moderately cold but agreeable temperature, and clear skies prevail almost uninterruptedly, is unsurpassable. Ice sometimes forms in January, and the thermometer registered 23° in January, 1893, on the river 28 miles below the city; this is, however, the lowest known. See Meteorological table for a long period, page 566.

**Fogs** are common in February and March.

**Diseases.**—Great precaution must necessarily be observed, even by long residents, to avoid exposure to the sun and chills, and this, with temperance in diet, will ordinarily secure immunity from sudden disease. Fever and ague, and sunstroke, are brought on by very slight exposures.

In China, besides dysentery and cholera, milder forms of intestinal diseases are common in summer, and occur probably from the promiscuous use of raw vegetables, or from chills caught when lying on deck at night.

There is a peculiar form of intestinal catarrh, popularly known as sprue, which attacks Europeans predisposed to illness; the mucous membrane is affected, diarrhoea is often profuse, and only fresh milk diet, and often hospital treatment, or removal from the country, can cure the patient.

## CHANNELS OR CREEKS CONNECTING CANTON RIVER WITH WEST RIVER AND EAST RIVER.

*Charts 3588, 2562.*

**General remarks.**—Between Macao and Canton, on the western side of the Canton river and estuary, westward to Samshui at the junction of North and West rivers, is a large tract of alluvial land, the delta of both rivers; it is intersected by a network of streams

*General charts 2562, 2661a and b.*

*Charts 3588, 2562. Var. nil.*

and canals, which, from the elevation of the land on the Si kiang or West river discharge into the Chu kiang or Canton river, and with the Tung kiang or Sawshi river (East river), which drains a large central portion of Kuangtung province, and flows into Canton river on its eastern side, causes the great volume of water in its estuary to be so disproportionate to its size. A considerable portion of the delta has been reclaimed by embankments in past times, and the process is still being continued.

The principal channels traversing this delta fall into Canton estuary between Kum sing mun and Second bar (*Lat. 22° 22' and 22° 58' N.*); besides these some small upper branches about Fat shan fall into Back reach, that portion of the river between Canton and the upper part of Blenheim passage.

The chief of these streams, Tam chau channel, traverses the entire delta south-eastward from Samshui at the junction of the Si kiang or West river with Pe kiang or North river, with branches to all the principal towns and districts in the delta. In the central or Shun tuk district nearly all the channels are connected, and one, which passes southward of Tai lung (locally Shun tuk), joins them to the West river, at 2 miles southward of Kum chuk. Besides these there is the narrow Nemesis channel or creek, which, entering from the Broadway (estuary of West river) in *lat. 22° 22' N.*, runs through Sek ki, and joins the Wang mun or first channel northward of Kum sing mun.

Wang mun, Tam chau, and Tai kok tau channels (the latter said to be closing up) run through level land dotted with many island-like hills, and enter the western side of the estuary through extensive mudbanks between Kum sing mun and Tai kok tau. The waters are kept in their channels by artificial embankments, without which almost the whole of the ricefields would be flooded at high water. The rice lands are principally eastward of Tai lung (*Lat. 22° 50' N., Long. 113° 16' E.*); westward of that town the land, although having the same features (level with island-like hills), is more elevated, being above high-water level, and cultivated with mulberry plants.

The embankments are wide, but being planted with fruit trees, with here and there the houses of labourers, leave but a paved path, about 6 feet wide, for foot passengers. The rivers and numerous canals are the ordinary mode of transport, as every field is approachable by a canal. The towns are also entered by water, the channels being staked across; in some cases an entrance is left wide enough to admit a large junk, the opening being closed by rude gates, as at Tam chau; in others these barriers consist of rows of stakes, with their heads above water, closely driven across the whole breadth of the

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

river, leaving but a narrow and circuitous channel near one bank, through which the current runs with great strength, and often the stakes are level with low water, forming a considerable danger to navigation. A pilot should be employed.

**Canton river delta.—Tides.**—During the summer months (May—September) the heights of tide and set of tidal streams are uncertain and variable in the creeks of Canton river delta, depending upon the levels of West and North rivers.

From September to May, with the ordinary low level of these rivers, the following rises of tide may be expected:—

Sam shui,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  feet; Kong mun, 3 to 5 feet; Kum chuk, 2 to 4 feet; Kum chuk creek, 3 to 5 feet; Tai ping bar, 2 to  $3\frac{1}{2}$  feet; and at Brick-kiln creek,  $3\frac{1}{2}$  to 5 feet.

The night tides are at this season always the higher, and in some of the smaller creeks, as in Kum chuk creek, this is the only tide experienced.

In Saiwan, Tam chau, Tai lung, and Junction channels the flood stream sets westward, and the ebb eastward. In summer, when the day tides are the higher, the water is high nearly all day at springs in some of these channels, owing to the day tide only falling about 2 feet.

**Traffic.**—Passenger traffic on a large scale is carried on in the channels of the delta by means of junks, about 80 feet long, 20 feet broad, and of  $2\frac{1}{2}$  feet draught; these are towed by steam launches, of which as many as 250 are in daily use. *See* West river regulations, pages 380-385.

The routes usually adopted are as follows:—

Canton to Sheklung, on the East river, viâ Whampoa, Junk passage, &c.

„ „ Tung Kwon, south of East river, viâ Whampoa, Tai ping, and To kao.

„ „ Heung shan, on the West river, viâ Chunchune, Ho kao, Yung ki, Sailam (sui), and Kong-hau.

„ „ Sun cheong and Kong mun, viâ Chunchune, Luk lao, Kum chuk, Kong mun, Sun wei, Shan sui hau, Kam shan, and Tam shui hau.

„ „ Shui Hing (at high water), viâ Moneypenny creek, Lan shek, Tsze tung, Sui tong, Sainam, Samshui, Ching ki, Kwang li, and How lik.

„ „ Shui Hing (at low water), viâ Chunchune, Luk lao, Kum chuk, and West river to Samshui, &c.

**Caution.**—The charts are corrected from information received from time to time, which is rare, and they may not always in slight

*General charts 2661a and b.*



*Charts 3588, 2562. Var. nil.*

details be in agreement with this text, but they show the various waterways leading from Canton river through the delta. No vessel, however small, should attempt these channels without a pilot on a first visit.

In the channels are stone groynes built out from the banks to reclaim the land, many of which extend nearly half-way across, some being marked at the end by a bamboo pole; those not marked are dangers.

**Pilots** can generally be obtained, but very few know all the creeks in the delta.

**Wang mun** (*Lat. 22° 35' N., Long. 113° 35' E.*) and its entrance (the Junk fleet entrance), with the Wang mun lights, are described with the western shore of Canton river (page 442).

**TAM CHAU channel** is the largest stream in the delta, and it discharges into Canton river estuary, westward of Swashway bank, and thence by Junk Fleet, the common entrance to it and to Wang mun entrance.

The Saiwan channel joins the Tam chau, southward of Tsz nai island, south-west of Saiwan town, thence it continues north-westward, and under the name of Fat shan branch it runs to Sainan and finally into West river. At 1½ miles southward of its junction with the Saiwan, two stone walls, each marked by a beacon, extend half-way across the river from its west bank.

**Tam chau channel to Blenheim passage.**—A small creek, narrow, and generally full of small craft, leads from the junction of Tam chau channel with Brick-kiln creek into Chunchune channel. It turns sharply to the eastward, and at about 2 cables within this turn a stone barrier, just awash at low water, extends from the northern bank to mid-stream; there is some difficulty in rounding this barrier, as a bend in the creek allows very little room. A rock, one foot dry at low water, lies close to the northern bank, near the eastern end of the creek. Sign-boards to go slow are placed at each entrance.

**Tidal streams.**—Between Tam chau channel and Blenheim passage the ebb stream sets to the eastward, and the flood to the westward.

**Chunchune channel** is comparatively broad, and is tidal. Having entered this channel from the creek just described, keep in mid-channel until abreast of a small tree on the western bank (a light is fixed on this tree at night); then close the eastern bank until the channel begins to curve to the east-

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

ward at the mouth of a creek, when cross to the western bank and keep close to it until about a quarter of a mile below the pagoda, which marks Chunchune creek entrance, the large mudbank on the eastern side of the channel is then passed; this bank extends four-fifths across the channel, and at half tide is awash, there never being more than 2 feet over it. A sounding pole should be kept going in this creek.

The channel lies near the west bank, and care should be taken to avoid the projecting wooden stakes.

**Chunchune creek** is narrow and winding; there is a least depth of 4 feet in its fairway at low water. It runs through flat, cultivated country, and its banks are very low. The entrance from Chunchune channel is marked by a pagoda on the edge of the south-eastern bank. A rock, drying one foot at low water, lies at the entrance, and close to the south-eastern bank. This creek always has a large amount of traffic on its waters; vessels should stop when passing other craft.

Abreast the first village on the eastern side is a sandbank, and here the opposite shore must be closed as nearly as possible; a curve in the creek makes this difficult. The bank ends before reaching the jetty when a mid-stream course is again taken. From abreast the jetty to some stone steps, half a mile to the northward, the eastern bank is protected by groynes, about 100 yards apart, which are covered about a foot, and project 10 feet. Two rocks, marked by small posts on the bank, are situated close to the eastern shore, one on each side of a sharp turn in the creek, where Fu lu kong creek branches off to the eastward; these rocks are said to have 3 feet water over them, and are easily avoided by hugging the western bank whilst making the turn round the point opposite. At about 2 cables past this turn, and just before reaching a village on the western bank, there are two rocks, awash at low water, abreast of each other and close off opposite banks; they are marked by a small post on the banks; a careful mid-stream course clears them.

Three small creeks, fairly close together, open into Chunchune creek at about half a mile beyond the last turn, and a rock, which dries one foot at low water, is close to the south-eastern bank, and opposite the middle of the three creeks. Near the mouth of this creek, and on the north-western bank, a stone barrier projects 12 feet, and 30 yards or more beyond the barrier is a rock close to the same bank, which is awash at low water. Further eastward is a rock close to the south-eastern bank, which dries one foot at low water; three small rocky hillocks in line lead over it; the hillock furthest inland

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

is about 50 feet high, the middle one 20 feet, and that nearest the bank 7 feet.

**Hamilton creek.**—There are no dangers in this creek, except two rows of fishing stakes, which present no difficulties. Hamilton creek (page 460) leads into Blenheim passage, at about half a mile south-eastward of Tai shek barrier.

**Fu lu kong** is one of the channels through which Chinese launches towing large flats proceed, from Tam chau channel to Blenheim passage, when the water does not admit of Chunchune creek being used; least water charted is about 6 feet, but subject to change.

**Wilder passage**, almost blocked up, leads westward of Tai kok tau in the main river; northward of it is Gutzlaff channel, leading within Gifu and Whitcomb islands, apparently also nearly blocked up.

**Hill passage**, which runs northward and southward parallel to Canton river, westward of Bolton and Wardroper islands, is navigated by steam vessels of about 9-feet draught; it enables craft going up or down Canton river to avoid the main traffic, and possibly to cheat the tide.

The banks around have been much reclaimed.

**Saiwan channel.**—A barrier consisting of stones and stakes extends nearly across this channel at  $3\frac{1}{2}$  miles westward of Forbes point (*Lat.  $22^{\circ} 53' N.$* ); the passage through it is about 70 feet wide, and lies close along its northern shore; care is required in passing through, as the streams are strong with swirls. The barrier is unmarked, and being generally covered is difficult of recognition; a few small trees on the north bank of the river, abreast the barrier, form a useful mark, and at night a small unwatched *white* light is exhibited for the use of the junks.

This channel is easily navigated to Saiwan town, which may be known by its pagodas. Numerous stone groynes extend from the banks on both sides of Saiwan channel.

Saiwan bank no longer exists, and the existence of the rock awash at  $1\frac{1}{2}$  miles eastward of Tsz Nai is considered doubtful.

In July, 1909, a depth of 3 fathoms at low water was found off the east extreme of Tsz Nai; the rock formerly supposed to lie off the south point of that island does not exist.

McCleverty and Tai kok chau channels are reported to be silting up, having depths of only 3 feet at low water in places; the rock supposed to lie off the entrance to the former channel does not exist.

The eastern entrance to the channel north of Tsz Nai is obstructed by rocks, which are covered at low water and extend from the north shore more than half-way across the channel.

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

**Light.**—The vicinity of these rocks is indicated at night by a small unwatched *white* light, exhibited for the guidance of junks.

Small steam vessels from Canton river to West river use this channel and creeks, and its continuation, the Tam chau, &c., north-westward.

**Tai lung channel**, in the centre of the delta, runs westward from Tam chau channel at Bullock point; it is broad for 3 miles, but Tai lung rocks bar the channel at the western point of Brine island (*Lat. 22° 47½' N., Long. 113° 18½' E.*), which is flat. A passage, having 6 to 8 feet at low water, runs close to the bank northward of these rocks, which have about 4 feet on them, and lie abreast the entrance of a small creek with numerous trees growing on its bank, the only ones in sight for some distance. This passage, which is about 50 yards wide, is used by small steam vessels drawing as much as 9 feet.

Between these rocks and Brine island is a passage with about 12 feet water, very narrow and difficult, and made more so by the chow chow water. There is deeper water in the narrow channel southward of Brine island, but the island must be kept aboard to avoid Tonze rock off the spur of Singletree hill on the southern shore, and another on the same shore abreast the entrance of a cutting through the island. In this cutting are depths of 3 to 4 fathoms, but it is very narrow at its northern end, where Woodcock rock (dry at low water) lies nearly in mid-channel; pass westward of this rock.

About 2 miles westward of Tai lung rocks, on passing the mouth of the large Shun tuk branch, keep over to the northern shore to avoid Clown rock, on which the depth is only 3 feet at low water, lying rather southward of mid-channel; they are connected with the southern shore about 3 cables above the point.

**Towns.**—Southward of the mouth of the Shun tuk branch is the large town Yung ki, which is a port of call for passengers, and in front of it on the bank is a small fort. One mile up the latter branch, on the eastern bank, near a small fort, is a landing-place, from which a road leads to the walled town of Tai lung or Shun tuk. The inhabitants of this town and district are apparently ill disposed to foreigners.

**Yellow reach.**—At 3 miles westward of Yung ki, the river trends southward for 1½ miles, the channel being very narrow, it then, turning eastward, suddenly emerges into Yellow reach, which is broad, and the connecting link of five channels.

**Kerr channel** flows south-eastward from the northern end of Yellow reach (*Lat. 22° 45' N., Long. 113° 14' E.*), leading directly to the sea by Wang mun. About 3 miles below Yellow reach, and 1½ miles below the entrance of Yung ki junction, the channel splits

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

round a low island, 4 cables northward of which, and stretching half-way across the river from the eastern bank, is Hand rock, with 5 feet water. After passing this steer for the northern point of the island, and pass close westward of it, to clear Mohr rock, with 4 feet water, situated one cable westward of the point of the island, and close to the western bank.

**Wan tung junction.**—At  $4\frac{1}{2}$  miles south-eastward of Mohr rock, is the southern entrance of Wan tung junction, which connects Kerr-channel with Tam chau channel. This junction, which is clear, and has not less than 7 feet water, runs up towards a range of hills 378 feet high, under which stands Whampoa town.

**Yung ki junction**, above mentioned, has only 6 feet at two places, but saves a distance of  $3\frac{1}{2}$  miles in proceeding south-eastward from abreast Yellow reach to Tam chau channel; at about 2 miles before reaching Tam chau channel it divides into three streams, the northern of which must be taken.

**Sailam channel** flows from the southern end of Yellow reach directly into Wang mun by a course 19 miles in length, which is similar to that of Kerr channel. It has two bars of 6 feet at one mile and 4 miles, respectively, from Yellow reach, and which are above and below Sailam town, northward of which this channel passes.

Sailam channel is used by small steam craft bound from Hong Kong to Samshui; it is shorter, deeper, and safer than Kerr channel.

**Junction channel** (*Lat.  $22^{\circ} 43' N.$ , Long.  $113^{\circ} 14' E.$* ) joins all these passages with the Si kiang or West river. It is the northern of two, divided by a flat island; the southern, Junction bend, is longer and has less water.

Proceeding westward by this channel, and avoiding Mahning bar, as charted, by keeping to the southern shore, as soon as the western end of Junction bend opens, hug the northern bank to avoid the shoal water extending across the mouth of Junction bend, hauling over to the southern shore in time to clear Forester rock, apparently three pinnacles, with one fathom or less water, situated about one-third the width of the river from the northern bank. There are strong eddies in the vicinity.

The best guide for the position of these rocks is the commencement of some rocky hills which abut on the north bank of the river, and abreast which it lies.

Opposite Mahning village, under the western part of these hills, is a low island with long spits from either end, and a rock on its northern side (not charted). The channel lies northward of it close to Mahning village, which is a port of call for passengers, and continues close along the northern bank for a mile. Mahning bar lies about  $1\frac{1}{2}$  miles westward of Mahning village; it has a depth of about 7 feet at low

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

water over it, and the river is said to be shallow right across (not charted). From the bar, keep in mid-channel until within a mile of First cliffs, 190 feet high, north side of its entrance from West river, when haul towards the cliff to avoid the spit off Lo sa tau point, south side of the entrance.

**Lung kong creek** connects with Junction channel at 3 miles eastward of First cliffs, whence it trends southward past Kwang mi village, finally connecting with West river in lat.  $22^{\circ} 30' N.$ ; it appears to have a least depth of 3 feet at low river.

**Kum chuk creek.—Si kiang, to Canton** (*Lat.  $22^{\circ} 48' N.$ , Long.  $113^{\circ} 5' E.$* ).—Kum chuk creek has a few sharp turns in it, but its chief obstruction is the ridge of rocks which lies across its mouth, leaving a channel only about 75 yards wide.

The route viâ Kum chuk, Luk lao, and Brick-kiln creeks, Chunchune channel and creek, and Hamilton creek, into Blenheim passage from the Si kiang, is navigable for vessels up to 170 feet in length, with about 26 feet beam, and a draught of 4 feet. This is the shortest route available throughout the year, and it is much used by small trading craft. (Sometimes during the summer season vessels cannot steam up the Kum chuk rapids, but come from Canton, viâ Mahning, Junction canal, into the Si kiang.) No attempt should be made to stem the rapid until after half flood. *See the rapid below.*

The current in these channels usually runs towards Canton river, but occasionally in winter, when the Si kiang is low, it may run in the opposite direction; this is caused by a high flood tide at springs.

The sounding-pole is always most necessary, but especially when hugging a bank in order to escape the full strength of the adverse current. The helmsman should be a picked man.

**Rapid.**—At the mouth of Kum chuk creek is a rapid formed by the rush of water from the Si kiang. There are three rocks in this rapid, one at its head, close to the north-western bank, and the others near the south-eastern shore. The rate of the current at the mouth of the creek in summer, at times, when the Si kiang is high and it is low water in the delta, is about 10 knots, and to stem it a speed of at least 13 knots is necessary; this is only a bare sufficiency, owing to the rise in the water at the head of the rapid, up which the vessel has to be forced; at times the passage is impossible. The rapid is short, and dangerous only from the rocks in it. The course to be steered is clearly indicated by the lines of broken water, from each side of the opening, meeting and continuing together down stream; this line should be followed whether going up or down the rapid, and it is practically in mid-stream. The entrance is very narrow.

Kum chuk creek, from this rapid, to Luk lao creeks presents no serious difficulty; a mid-stream course is safe. Close the north-western bank when going against the stream, using the sounding pole.

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

**Luk lao creek.**—The entrance to this creek from Kum chuk creek is scarcely noticeable until nearly abreast of it; there is a small joss-house with a few small trees on the eastern entrance point. The creek is narrow, varying in width from 70 yards to 40 yards, and there are four sharp turns in it. The current runs northward in summer, the velocity being at least 4 knots, and in winter 2 to 3 knots. When proceeding with the current in summer navigation is difficult, as, besides the intricacy of the channel, there are numerous rafts, junks, launches towing passenger junks, and small craft to avoid. All turns should be taken at as slow a speed as possible.

On entering the creek from Brick-kiln creek, the entrance is unnoticeable, and is only indicated by a small joss-house and tree on its western bank. Proceeding southward against the current is easy, but slow speed round the turns is necessary.

**Brick-kiln creek**, leading northward from Kum chuk creek, is tidal, with a rise of from 4 to 5 feet, except when the upper rivers are in flood; it presents no difficulties, being broad, with few dangers. A rock off Wang li is marked by a buoy, which should be left to the southward; a bank extends off the northern shore at  $1\frac{1}{2}$  miles eastward of this rock, and a row of fishing stakes  $2\frac{1}{2}$  miles eastward of this bank should be left to the southward. The stream usually flows eastward. Keep a mid-stream course, but in steaming against the stream hug the northern side, passing to mid-stream at the bank, and having passed the buoy at Wang li, cross to and keep the southern bank, returning to mid-stream when nearing the village and trees near the entrance of Luk lao creek.

**Tailung creek**, from Wang li village (*chart 3588*), connects Brick-kiln creek with the eastern end of Tailung channel, and with Tam chau channel; it is clear of rocks, from 80 to 150 yards broad, and, except at the southern part, has a general depth of 5 feet at low river; the western part, as far as the creek leading to Tailung (Shun tuk) (*Lat.  $22^{\circ} 50' N.$ , Long.  $113^{\circ} 15' E.$* ), is much frequented by steam launches. The barrier in its south-eastern portion, near Kerr point, is very narrow, and has a depth of 2 feet at low river.

**Fat shan branch** (the eastern end of which connects with Canton river near Parker point), Moneypenny creek, its continuation south-westward to Tam chau channel; Tam chau channel, and Sainam reach, form the direct channel between Canton and Samshui; it is said to be unnavigable by vessels drawing more than 4 feet. About 2 miles below, or eastward of Samshui, on this branch, stands the flourishing commercial town Sainam.

In Fat shan branch the best water is reported to be southward of Hyacinth island, but there is a rock in the fairway there.

*General charts 2661a and b.*

*Charts 3588, 2562. Var. nil.*

Money Penny creek makes some fairly sharp turns, but has a depth of not less than 10 feet throughout.

Tam chau channel, just above the junction with Money Penny creek, has a depth of 5 to 6 feet; above this there is better water until near the junction with Fat shan branch (western end), where a bar crosses the channel with a depth of only 18 inches of water on it.

Sainam reach has varying depths, the least being 18 inches, and the worst place being just below Samshui, where a flat extends right across.

In summer these channels can be used without difficulty, but not too late in the year, when any case of grounding might entail the chance of remaining throughout the winter.

*Charts 1742, 3588, 2562.*

**RIVERS ON EASTERN SIDE of Canton river.—**  
**Tung kun river, or Sawshi channel** (*Lat. 22° 53' N., Long. 113° 35' E.*), is entered between Blake point and Dundas island, page 450; it is about 23 miles long, and joins East river at Sheklung, being connected with Second bar creek by Junction creek. The river flows through flat country, with paddy fields on either side, and has a general breadth of from 100 to 200 yards. On proceeding up the river it is found to narrow considerably after passing the third large creek on the western side, a position from which Ai kong, a shallow creek, branches to the eastward, rejoining the main stream at Tung kun, and with a southerly branch connecting with Taiping.

**Tau kao** is a large village on the north bank at about 8 miles within the river; at the south end of the island, below this village, there is a bar with a depth of  $2\frac{1}{2}$  feet at low water.

At Lung wan, 3 miles above Tau kao, the river is narrow, and takes a sharp turn, having stone walls extending from the south bank.

**Tung kun**, situated 2 miles above Lung wan, is a large walled town on the south bank, having a population of about 150,000; there is a post office and a large German mission hospital; daily communication is maintained by steam launches with Canton and Taiping (not on charts).

**Sek ki** is a large village on the north bank, about  $5\frac{1}{2}$  miles above Tung kun, and on the opposite bank is Lok Fa pagoda, conspicuously situated on a hill. A wide creek branches to the westward between Tung kun and Sek ki, passing through Chung tong and joining East river at Cha ko.

Between Tung kun and Sheklung the river is wider than below Tung kun, but has only a depth of 2 feet in places, with many sandbanks.

*General charts 2661a and b.*



*Charts 1742, Second bar pagoda to Whampoa; and 2562, 3588.*

**Junction creek** has in it a rocky shoal and sandbank, the channel, with a depth of 4 feet, being situated close to the east bank.

**EAST RIVER (Tung kiang).**—The principal entrance to this river is through Escape creek, south of Davis island; Junk passage is a narrow shallow entrance north of that island.

East river is said to be navigable during the summer freshets for a distance of 40 miles above Hwei chau; rapid changes of level are experienced in it.

**Escape creek** (*Lat. 23° 3' N., Long. 113° 31' E.*).—An extensive sandbank fronts the south coast of Davis island, to avoid which vessels should enter from well to the southward, keeping on the eastern side of the channel, but crossing to the western side before reaching the first village on the eastern bank; the western side should then be followed until arriving at the junction with Junk passage, about 5 miles up, where there are some rocky hills faced by cliffs. In 1908 this channel was used by vessels of 8-feet draught at all times of tide.

**Junk passage** has a depth of about 2 feet at low water, and is about 30 yards broad, with some sharp turns; it is free from dangers except a rock, covered at high water, at the eastern end, situated at the foot of some low cliffs on the northern bank.

The paddy fields on both sides cover at high water, rendering the channel difficult of recognition, but it is much frequented by steam launches.

**Escape creek to Sheklung.**—East river varies in breadth from 4 to 2 cables, and is shallow, having many islands and sandbanks, but with few rocks. The surrounding country is flat and cultivated, with several large villages. From the junction of Escape creek and Junk passage, where a bank extends from the north side, keep on the southern side as far as Lam goa, a small village with numerous brick-kilns, immediately above which is a bar, with a depth of 6 feet; the channel here lies between two sandbanks, the position of which is recognised by a creek on the north shore, having a tree on either side of its entrance.

From this bar, follow the north side of the river to San Tong, a town of 5,000 inhabitants, passing a large creek on the south side, and thence to Ti tung, between two islands, one cultivated and the other with a brick-kiln on it. Above Ti tung the river divides into three channels, of which the southern is not used; the northern and deepest, with a depth of 4 feet at its western end, is tortuous, having on its northern bank the large village of Seung chin, with a wooden pier.

*General charts 2661a and b.*

*Charts 1742, 2562, 3588.*

The middle channel is always used at high water, but is obstructed by a bar, with a depth of 2 feet, to the northward of Flat island. At this bar the tidal rise is from 3 to 4 feet; above the bar only the ebb stream is experienced, below it the flood stream is met.

Above the bar keep southward of Grass island, and then gradually cross to Sum Tong, to the eastward of which is a rock, always covered, which should be left on the port hand.

At the junction of the northern and middle channels a bar of 4 feet is crossed in mid-channel, when the south side is followed to Wong Chong creek, where Shektan creek, shallow and not navigable, branches to the north-eastward.

Pass south of the island situated eastward of Wong Chong creek, and then keep on the north side, steering for the eastern end of the trees. A shingle bank extends from the north-east point of the island, from which keep in mid-channel to Sheklung.

**Sheklung** is situated at the junction of East river, with the Tung kong and Wong ka san rivers; the Kaulung-Canton railway passes through it; bridges are built across East river at the western end of the town, and also across Tung kong river.

**Tung kong**, on the river of the same name, is situated about 15 miles below Sheklung; it is approached from Canton river through Sawshi channel.

Between Tung kong and Sheklung the river is shallow, and can only be navigated during the summer freshets.

**Sheklung to Hwei chau.**—Above Sheklung, East river bends sharply to the southward, and narrows considerably, again expanding on turning to the eastward; above this there are sharp turns, but the channel is much encumbered with sandbanks, and in winter is almost dry.

As there are no leading marks, the service of a pilot is necessary. From Sheklung to Tung min the country is flat and cultivated, and above that point there are low hills on both sides.

**Pok lo**, a walled town with about 15,000 inhabitants, is situated on the north bank of the river, at 11 miles below Hwei chau.

**Hwei chau** is situated on the south bank at about 55 miles above Sheklung, and 80 miles from the entrance to East river from Canton river. It is built in two parts, divided by a stream, over which there is a bridge of boats, and has a population of about 100,000. There is a telegraph and post office, and during the summer communication is maintained with Sheklung by steam launches.

Provisions are scarce, and meat cannot be obtained.

The difference in the river level at Hwei chau in summer and winter is said to be 30 feet.

*General charts 2661a and b.*

## CHAPTER X.

## HONG KONG, AND ADJACENT ISLANDS AND ANCHORAGES.

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VARIATION nearly stationary.

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*Chart 1466, Hong Kong.*

**WEST LAMMA CHANNEL.—Depths.**—West Lamma channel lies between the islands fronting the eastern coast of Lantau island and Hong Kong island. Its entrance, between Chung island and Lamma island, is about 4 miles wide, with depths of 7 to 5 fathoms; this channel leads to the western entrance of Hong Kong harbour, and to Kap sing mun, at its north end, which pass connects with Canton river.

From Pa pai island (Tai ku chau) and Chau kung, a bank, with depths of  $4\frac{1}{2}$  to  $4\frac{1}{2}$  fathoms, stretches nearly across to the north end of Lamma island, leaving a channel half a mile wide between that island and the bank.

*Chart 1180, Approaches to Hong Kong.*

**Western shore. — Lantau island: South and east coasts.**—The west and northern coasts are described on page 438.

Southward of Lantau peak, there is on the coast a high and rounded point, 537 feet in height, to the eastward of which is situated a broad bay with general depths of 3 to 4 fathoms.

The eastern side of this bay is formed by a rugged peninsula which rises to a jagged summit, 996 feet in height, forming the south-east point of Lantau.

Villages of a fair size are situated in both the eastern and western corners of the bay.

**Rocky islet** (*Lat.  $22^{\circ} 13' N.$ , Long.  $113^{\circ} 57' E.$* ), situated 8 cables eastward of the western point of the bay, is 95 feet in height.

**Mid rocks**, one mile north-eastward of Rocky islet, are a group of small wedge-shaped rocks which dry 4 feet, and have a depth of  $3\frac{1}{2}$  to 4 fathoms close around them.

**Coast.**—From the south-east point of Lantau the coast trends to the northward, and is indented with bays of about a mile in depth.

*General charts 1180, 3026, 1962, 2661a and b, 1262.*

*Chart 1180, Approaches to Hong Kong. Var. nil.*

The southern of these trends in towards the narrow neck of the peninsula forming the south-eastern point; the southern part is shallow, and affords but little shelter.

**Silver Mine bay.**—At the northern part of this bay is situated Ngang kong (Silver Mine bay), which takes its name from a small mine, now disused, situated on a hill at the back of the cultivated ground at the head of the bay. On the northern side of the head of this bay, and a little way up the hill, is a conspicuous tall chimney.

At the head of the bay the ground is well cultivated, and three fair-sized villages stand at the back of the fields.

The best landing is on the southern side of the head, where a small stream flows into the bay.

**Dangers.**—A rock, awash at low water, lies  $2\frac{1}{2}$  cables from the head of the bay and  $1\frac{3}{4}$  cables from the northern shore; it has 2 fathoms around it, and should be avoided by small craft anchoring in that vicinity.

A rock, which dries 6 feet, lies  $2\frac{1}{2}$  cables south-south-westward of the northern entrance point of Silver Mine bay; it is steep-to, with depths of  $3\frac{3}{4}$  to 4 fathoms around.

**The coast** northward of Silver Mine bay trends northward for about 2 miles, and then north-eastward for about the same distance to the north-east point of Lantau, forming in the latter part two bays.

The southern of these is nearly a mile in width, and has two small islets in its entrance, between which and the southern shore is a rock, which dries 6 feet at low water. There is only a depth of about 2 fathoms in this bay, but otherwise it appears free from dangers and available for small craft.

**Comber rock** lies  $2\frac{1}{2}$  cables south-east of the south point of this bank; it dries 3 feet, and is marked by a staff with cage, placed by H.M.S. *Rambler*, not to be depended on.

**Rock.**—A rock, with a depth of 5 feet at low water springs, lies  $1\frac{1}{2}$  cables off the coast, at a distance of 7 cables,  $188^{\circ}$  true, from Comber rock.

The northern bay is about three-quarters of a mile in depth and one-third of a mile wide; it extends in a north-north-westerly direction, has  $3\frac{1}{2}$  fathoms in its entrance, and shoals gradually to the head.

**ISLANDS on western shore.**—**Sha ku chau (Patung island)** lies southward of the peninsula forming the south-east extreme of Lantau island, and is separated from it by a channel 6 cables wide, with depths of  $4\frac{1}{2}$  to 7 fathoms. The island is  $8\frac{1}{2}$  cables long and of varying width, with two peaks, of which the north-western (609 feet) is the higher, and is surmounted by large boulders; the

*General charts 3026, 1962.*

*Chart 1180, Approaches to Hong Kong. Var nil.*

south-eastern summit is 511 feet high. On the north-western side of the island, and extending  $1\frac{3}{4}$  cables from the shore, is a ledge of rocks 7 feet high. Between them and the shore of the island is a channel about half a cable wide, with depths of 2 to 3 fathoms.

**Chung island**, on the west side of entrance to West Lamma channel is  $1\frac{3}{4}$  miles in length, its northern and southern portions being joined by a narrow neck of sand, less than one cable wide, on which a populous and thriving fishing village is situated.

The northern summit is 350 feet high, and the southern 238 feet.

The bay on the western side of the narrow neck appears to offer good shelter, but as it is generally full of junks there is little room for even a small vessel unless secured beside them.

The northern end of the island is separated from the south-east point of Lantau by a channel  $5\frac{1}{2}$  cables wide with depths of 3 to  $4\frac{1}{2}$  fathoms.

**Beacon light**.—Near the centre of the above channel is a rock which dries 2 feet at low water. An iron staff beacon, with small cage, has been placed on this rock, from which a small *red fixed* light is shown at night.

*Chart 1466, Hong Kong.*

**Chung rock**, which dries 5 feet at low water, lies 3 cables eastward of the eastern point of Chung island; a head, with  $1\frac{3}{4}$  fathoms over it, lies one-third of a cable westward of this rock.

**Pa pai (Tai ku chau)** lies off the entrance to Silver Mine bay; it is  $1\frac{4}{10}$  miles long, about two-thirds of a mile broad, and rises to a height of 598 feet near the centre. To the westward of its southern summit (396 feet), and  $1\frac{3}{4}$  cables from the shore, are three conspicuous pinnacle rocks, the highest 18 feet high.

**Chau kung** is situated north-eastward of Pa pai, and separated from it by a channel  $1\frac{1}{4}$  cables wide, with rocks which dry on both sides. The island is rather more than half a mile long, north-east and south-west, one-third of a mile broad, and rises to a height of 354 feet near its north-eastern end.

**Peang chau**, situated about one mile northward of Chau kung, rises on its northern part to a height of 149 feet, and on its southern to 321 feet; these two parts are connected by a low sandy neck forming a sandy bight open to the eastward. On this neck is a fair-sized village, with limeworks at its northern end.

**Tai pak island** lies close westward of the northern end of Peang chau. It is about a cable in extent, and 65 feet high. Off its south-western and southern sides are two conspicuous rocks, 15 feet and 21 feet high, respectively.

*General charts 3026, 1962.*

*Chart 3280. Hong Kong waters, West.*

**Cheang chau ching**, 113 feet high, with a cairn on the summit, is about 2 cables long and  $1\frac{1}{2}$  cables broad, being separated from Peang chau by a channel about three-quarters of a mile wide.

**Kau i chau**, the outer island of the group extending eastward from Lantau, is somewhat square in shape, about 3 cables long and broad, attaining a height of 370 feet; it is separated from Cheang chau ching by a channel two-thirds of a mile broad, having a general depth of  $5\frac{1}{2}$  fathoms.

**Douglas rock** (*Lat.  $22^{\circ} 17\frac{1}{2}'$  N., Long.  $114^{\circ} 4'$  E.*), awash at low water springs, is situated nearly in the middle of the northern part of this channel.

*Chart 3429, East Lamma channel; also 1466. Var.  $0^{\circ} 10'$  E.*

**EASTERN SHORE.—LAMMA ISLAND** is separated from the south-west coast of Hong Kong island by East Lamma channel, about one mile wide. The island, 1,160 feet in height, consists of a succession of steep hills of barren appearance, is of irregular shape, about 4 miles in length, north and south, and nearly cut through by Sokku wan, a deep bay near the centre of its eastern side, the low isthmus connecting the two portions being only 3 cables wide. It is cultivated where possible, but the population is scanty and poor.

**Luk chau wan** (*Lat.  $22^{\circ} 14'$  N., Long.  $114^{\circ} 8'$  E.*), the bay on the north-eastern side of Lamma island, lies between the bluff of Pa chau hill, 447 feet high, over Pa kok, the north extreme of the island, and Luk chau or George island, 215 feet in height, off its eastern point. It affords good anchorage all over it during the south-west monsoon period, in depths of 5 to 6 fathoms, good holding ground; the southern head, within Lukchau, has depths of 4 to 5 fathoms, fairly close to the shore, and is free from danger.

There is a boat channel between Lukchau and the point off which it lies; both sides are rocky, and the fairway should be kept by heavy boats using it.

**Sokku wan** (Picnic bay) lies between Lukchau island and Wong chu kok, the eastern extreme of the island. It affords good anchorage for vessels of moderate size in 6 to 7 fathoms, and its outer part is free from dangers. At 3 cables from its head it narrows to about 3 cables in breadth, with a rocky flat extending nearly a cable from the southern side, and to a less distance off the northern side, but there is a depth of 5 and 4 fathoms nearly to its head.

On the southern side of the bay the hills rise steeply to the summit of the island named Pok lu chau or Mount Senhouse.

*General charts 3026, 1962.*

*Chart 1466, Hong Kong. Var. 0° 10' E.*

**Unkok**, the south-eastern point of Lamma island, is the termination of a rocky hilly promontory, and there is a depth of over 10 fathoms at a distance of 60 yards around it. The point rises suddenly to Unchau, a small round summit, 178 feet high, and conspicuous on northerly and southerly bearings. The promontory rises to a height of 370 feet.

Between Unkok and Wong chu kok, about  $1\frac{1}{2}$  miles apart, is a deep bay, with a shallow cove at its head, fronted by rocks above and below water. It is of no value as an anchorage, as a constant swell sets in, and there is no landing except in the finest weather.

**Sam wan**, a narrow bay on the western side of Unkok, extends in a north-westerly direction for over three-quarters of a mile, and there is a sandbeach at its head. It is clear of shoals in the middle, but it is not recommended, as the swell is almost continuous, and the landing, even at its head, is bad.

**Tai kok**, the western point of Sam wan, is high and rocky. The coast, high and rocky, with two small indentations, trends westward from it for  $1\frac{1}{4}$  miles, and then turns northward for over a quarter of a mile to Hamitsui, a rounded sloping point. There are no off-lying dangers.

*Charts 3429 and 1466.*

**Hami wan**.—The coast from Hamitsui turns north-eastward and northward, forming Hami wan, a bay 2 miles in length north and south, and three-quarters of a mile deep, affording good anchorage for all vessels; it is well sheltered from easterly winds. The northern shore of Hami wan is a steep-sided promontory, rising 387 feet above the sea, locally called Ching lum leng; its western extremity, which is the north point of the bay, is Wo lo tsui, composed of high rocks with no off-lying dangers, so that it may be safely closed.

**Lung shui wan**, a smaller bay which may be used by small vessels, lies on the northern side of Ching lum leng. There are several villages and cultivated valleys in this locality.

Otsi pai, a rock which dries 5 feet, lies about 150 yards off the centre point of the bay.

**Shek lok tsui**, the north-western point of Lamma island, rises steeply within.

**A reef** extends a cable off the point, with a rock dry 2 feet at low water at its extreme; within it is a rock which dries 7 feet. The south-west extreme of Lamma open of Wo lo tsui leads westward, and Magazine island open of the north extreme of Lamma island, leads northward of the reef.

*General charts 3026, 1962.*

*Chart 3429. Var. 0° 10' E.*

The coast from Shek lok tsui trends eastward to Pa kok, the north extreme of Lamma, and is foul from a half to one cable off.

**Pa kok**, the north extreme, is prominent, and fairly steep-to. Pa chau hill lies within it, before mentioned.

East Lamma channel is described on pages 524, 525.

*Chart 3280, Hong Kong waters, West.*

**Fairway.**—Northward of Lamma island, West Lamma channel is reduced to a breadth of  $1\frac{3}{4}$  miles between the west end of Hong Kong island, and Green island, which lies off it, on the east, and Kau i chau, on the western side.

**Tidal streams.**—In the Lamma channels the stream runs northward while the water is rising at Kap sing mun, and southward while it is falling there. The rate of the streams seldom exceeds 2 knots. The depth in West Lamma channel being an important matter for vessels of deep draught, the tidal rise there can be determined from the Hong Kong tide tables. The datum of the chart is nearly the same as that of the tables.

**Directions.**—West Lamma channel is free from dangers in and near its fairway. Chung rock, which dries 5 feet at about 3 cables eastward of Chung island (page 482) on the western side, and the reef which extends about a cable off the north-west extreme of Lamma, should be given a berth. Vessels above 20-feet draught should keep within half a mile of Lamma, where the depths are not less than  $5\frac{1}{2}$  fathoms.

*Charts 3632, 3280.*

**KAP SING MUN**, or Kap shui mun (Throat gates) between the eastern end of Lantau and Chung hue, leads from West Lamma channel, and from the western entrance to Hong Kong, to Canton river. It is divided into a broad channel to the eastward and a narrow one to the westward, by Ma wan, on the south side of which is Kap sing islet.

The western channel is that almost invariably used by vessels, as it is shorter than the eastern, and as the tidal streams run with nearly the same velocity, from 3 to  $4\frac{1}{2}$  knots, on the northern side of Ma wan as in that channel, there is little to be gained by taking the longer route. It is only necessary to keep in mid-channel.

**Bunsansiah rock** (Lat.  $22^{\circ} 19\frac{1}{2}' N.$ , Long.  $114^{\circ} 4' E.$ ) lies on the western side of the fairway of the southern entrance at  $6\frac{1}{2}$  cables eastward of the nearest point (84 feet) of Lantau island. It is a pinnacle awash at low water, with depths of 6 to 8 fathoms at a short distance.

*General charts 1466, 1180, 3026, 1962.*



*Chart 3632, Wan chu chau to Brothers point. Var. 0° 10' E.*

**Chung hue island** lies  $1\frac{1}{2}$  miles eastward of the north-east point of Lantau, the channel which separates them being known as the Kap sing mun (Throat gates); between the island and the mainland to the eastward is Rambler channel.

The island is hilly, and rises at its southern and higher end to a height of 1,091 feet, the northern end being 709 feet high; a neck of land, a little over 300 feet in height, divides these two ridges.

There are three small shallow bays on the western side of Chung hue; the entrance points, however, are steep-to, and may be passed at one cable's distance.

**Ma wan.**—The east coast of this island is formed of sandy beaches and rocky points, with shoals and foul ground extending off them for a distance of 2 or 3 cables. A shoal, with a least depth of  $4\frac{1}{2}$  fathoms, and 8 and 9 fathoms around, lies  $2\frac{1}{2}$  cables eastward of the south-east point of the island.

A spit of foul and rocky ground extends eastward for  $1\frac{1}{2}$  cables from the north-east point of Ma wan; at the outer end of this spit is a cluster of rocks which dry 7 feet at low water. Boats and small craft should not approach the spit too closely when rounding the point on the ebb tide, as the tidal stream sets strongly over it.

The north coast of Ma wan is more or less steep-to; there is a sandy bay in the eastern part of it, off the western point of which the 3-fathoms contour line extends for about half a cable.

From the north-west point to the west point of Ma wan is a distance of 4 cables, with an open bay between.

Close southward of the west point is a light, with a stone pier and the fishing village of Ma wan; from this the coast trends south-eastward to the south point of the island, and is steep-to.

The southern summit of the island is 213 feet high, and the northern 165 feet high.

**Kap sing islet**, about  $1\frac{1}{2}$  cables long, one cable wide, and 102 feet in height, lies  $1\frac{2}{10}$  cables south-eastward of the south end of Ma wan, the channel between being shoal and foul.

**Western channel.**—The western channel of Kap sing mun, between Ma wan and Lantau, is  $1\frac{2}{10}$  cables wide at its narrowest part, and  $1\frac{4}{10}$  cables broad between the 5-fathoms contour lines on either side. Both shores are fairly steep-to, the Ma wan shore being rather more so than the other.

**Lights.**—On the southern summit of Kap sing islet, from a white skeleton tower, 28 feet in height, is exhibited, at an elevation of 124 feet above high water, a *group flashing white light*, giving a group of *two flashes every twenty seconds*, thus:—*flash, two seconds; eclipse, three seconds; flash, two seconds; eclipse, thirteen seconds*. It is visible from a distance of 5 miles. For sector see Light list and charts.

*General charts 1466, 1180, 3026, 1962.*

*Chart 3632, Wan chu chau to Brothers point. Var.  $0^{\circ} 10' E$ .*

**Fog bell.**—During thick or foggy weather, a fog bell, operated by machinery, will sound from four to six strokes per minute.

A *red fixed* light, elevated 50 feet, and visible from a distance of 6 miles, is exhibited from a white mast standing on the western point of Ma wan, western channel; there is a white hut at the foot of the mast.

**Lantau.—Coast** (*continued* from page 481).—The coast of Lantau bordering Kap sing mun is indented, and trends in a general north-north-west direction to a small bay abreast the fishing village on Ma wan, whence it trends more to the westward to the north point of the island. From this point the coast turns to the south-westward, forming a shallow bay, which is divided into two parts by a narrow point. At two-thirds of a mile from this narrow point is situated a shallow bay three-quarters of a mile in extent. The western entrance point of this bay is a double point, off the eastern side of which is a small grassy island, 84 feet in height, connected with the point at low water.

**Tides.**—The times of high and low water in Kap sing mun and Rambler channel vary considerably when compared with the times of high and low water at Hong Kong dockyard, but the mean results are as follows:—

At Cap island, off the north-east point of Chung hue, the time of high water is 40m. later than at Hong Kong dockyard, and at a point on the north-west coast of Lantau, abreast of East Brother island, it is 1h. 12m. later than at Hong Kong.

In the small bay just south of the west point of Ma wan, the times of high and low water were found to vary considerably as compared with Cap island, the difference in two days being from 30m. before to 1h. 5m. after the times at Cap island.

There is but little difference in the range of tide in Kap sing mun as compared with the range at Hong Kong dockyard.

**Tidal streams.**—The tidal streams in the vicinity of Kap sing mun are strong, and at the sides of the channels cause whirls and eddies sufficient to make a boat or small craft unmanageable.

The ebb stream flows to the eastward, parallel to the land past the Brothers islands, increasing in velocity as the channel narrows at the north point of Lantau, where it runs with a velocity of over  $3\frac{1}{2}$  knots at springs.

The northern portion of this stream flows between the north coast of Ma wan and the mainland, attaining a greater velocity, as much as  $4\frac{1}{2}$  knots having been obtained just north of the north-east point

*General charts 1466, 1180, 3026, 1962.*

*Chart 3632, Wan chu chau to Brothers point. Var. 0° 10' E.*

of Ma wan. The stream divides at the north-west point of Chung hue, one part passing northward of that island and turning south-eastward and southward through Rambler channel, with a velocity at springs of about  $2\frac{1}{2}$  knots; the other part turning south-eastward and southward, flowing through the broad channel westward of Chung hue, with a velocity of from  $3\frac{1}{2}$  to  $2\frac{1}{2}$  knots. The latter stream is marked by tide-rips, which move through the channel and are generally found at no great distance from the Chung hue shore. At times, during the ebb, still water and occasionally a counter current to the northward may be found along the east side of Ma wan.

The southern portion of the ebb stream, after passing the north point of Lantau, strikes towards and to the westward of the west point of Ma wan, and is then deflected to the southward through the narrow channel westward of that island. In the bay between the northern and western points of Ma wan, the stream runs in all directions, part to the northward and part recurving to the southward in whirls. Close north-westward of the west point, it sets strongly towards that point, and into the little bay southward of it; further along it sets generally directly through the channel, the greatest velocity recorded being a little over 4 knots.

The flood stream in Rambler channel is weak, and at times non-existent. That through the channel between Chung hue and Ma wan is also weak compared with the ebb, running with a velocity of only  $1\frac{1}{2}$  knots in the centre of the channel, and of  $2\frac{3}{4}$  knots to the north-north-westward, past the spit off the north-east point of Ma wan. The main stream of the flood probably runs to the westward until it strikes the east coast of Lantau, and is there deflected through the channel between Ma wan and Lantau, where it attains a considerable velocity, as much as  $5\frac{1}{2}$  knots having been registered. It meets the weaker current flowing to the westward at a line joining the north point of Lantau and the north-west point of Ma wan, but is only slightly deflected by it, and flows across in a north-north-west and north-west direction until it strikes the coast of the mainland. Here it turns to the westward and runs along parallel to the shore, the current in the southern part of the channel being but slight.

**RAMBLER CHANNEL** lies eastward of Chung hue, and connects Hong Kong harbour with Canton river, similar to Kap sing mun, but is a longer and more difficult passage. It varies in width from  $1\frac{1}{2}$  cables at its northern end to  $1\frac{9}{10}$  miles at its southern end, is free from danger, but is not recommended except for small craft, as the tidal streams, especially the ebb, set strongly through, and it is much frequented by junks. *See tidal streams, above.*

*General charts 1466, 1180, 3026, 1962.*

*Chart 3632, Wan chu chau to Brothers point. Var. 0° 10' E.*

**Gin Drinkers bay.**—The south-east entrance point of Rambler channel lies  $7\frac{1}{4}$  cables northward of the northern point of Wan chu chau (Stonecutters island), Hong Kong harbour. From this point the coast trends north-westward into Gin Drinkers bay, which is  $7\frac{1}{2}$  cables wide at the entrance, and extends back about the same distance. At half a cable from the southern point of this bay, and connected with it by a drying reef is an islet 92 feet high. Pillar island, which is 159 feet high, and 2 cables in length, lies nearly in the centre of the bay; an isolated rock, 4 feet high, the outer side of which is steep-to, lies half a cable from the south-west side of Pillar island.

Gin Drinkers bay is shallow, drying out for nearly 3 cables at its head, where a small stream flows into it; on the south side of this stream is a village above which the ground rises steeply to Golden hill.

Northward of Gin Drinkers bay the coast trends north-westward, and then turns to the north-eastward into the bay known as Chen wan.

**Channel rocks** are a group of rocks about three-quarters of a cable in extent, lying at the northern end of a patch of shallow and foul ground, extending 2 cables in a north-west and south-east direction with a width of one cable. These rocks are covered at high water, and the highest of them, which dries 7 feet at low water, lies  $5\frac{3}{4}$  cables  $332^\circ$  true from the summit of Pillar island. The rocks are nearly steep-to on their western side, and may be passed on that side at a distance of half a cable.

**Cap island** lies off the north-east point of Chung hue. It is  $2\frac{3}{4}$  cables long,  $1\frac{1}{2}$  cables broad, and 106 feet high. Between it and Chung hue is a shallow junk harbour known as Mun tsai tong, which in bad weather is crowded with junks. About 3 cables southward of this is Changi bay, which is also used as a shelter. Off its entrance is a group of rocks, which dry 7 feet, with shoal water around. For other dangers, *see* the chart.

**Chen wan.**—Northward of Rambler channel is Chen wan, a bay about half a mile wide, the head of the inlet extending eastward of the Brothers (page 439), in Canton river; there is a lot of sand, dry at low water, off Chen wan village, with rocks and shallow heads in places extending out to the 5-fathoms contour line.

There is good anchorage in this bay in 6 to 8 fathoms, mud bottom, to the northward of Cap island, and the south-eastern part of the bay is a good anchorage for small craft, in a depth of 2 to 4 fathoms; it is, however, difficult of access, being crowded with junks in bad weather or on the first approach of a typhoon.

In this latter anchorage there is very little tidal stream, but in the centre of the bay the ebb runs to the eastward and south-eastward

*General charts 1466, 1180, 3026, 1962.*

*Chart 3632, Wan chu chau to Brothers point. Var.  $0^{\circ} 10' E$ .*

with a velocity of  $2\frac{3}{4}$  knots a springs; the flood stream, however, is a good deal weaker, and at times disappears altogether.

Two small streams flow into the bay, one through the village of Chen wan, and the other on the north side of the bay. On the latter stream are several mills for pounding camphor-wood chips into powder for the manufacture of joss-sticks. In the north-east corner of the bay is a fairly large samshu factory.

**Tam o shan.**—The land to the northward of Chen wan village rises steeply, and at  $2\frac{1}{4}$  miles in that direction is Tam o shan, 3,640 feet in height, and the highest point in this vicinity.

**Channel into Canton river.**—The channel west of Chen wan trends a little to the southward of west, the shores sloping steeply to the water on both sides. It is free from dangers, and the coast of the mainland may be approached within the distance of a cable and less in places. On the Chung hue side the coast falls back a little, forming a shallow bay, where shoal water extends  $1\frac{1}{2}$  cables from the shore in places.

**North shore.**—**Pak sha kiu**, a hill 1,553 feet high, and surmounted by a few large boulders, rises from the north shore of the channel.

**Tingkao village** is situated in a sandy bay, on the mainland abreast the north-west point of Chung hue. The 5-fathoms contour line here extends from the mainland for about  $2\frac{1}{2}$  cables, and in the fairway to the south-westward of this is a bank of rather shoaler water, about 2 cables in extent, with a least depth of 3 fathoms. Between this bank and the north-west point of Chung hue is a passage of about a cable in width, with deep water.

The coast from Tingkao village, just west of which is a rather conspicuous low hill, 138 feet high, with cultivation on the top, trends to the west-south-westward for half a mile to a rounded, steep, and rocky point. From this point it trends north-westward to a sandy bay, with flat, cultivated ground at the back, on which are two villages; shoal water extends for about  $1\frac{1}{2}$  cables off the shore at the head of this bay, at the mouths of two small streams which flow into the centre. From this bay the coast again trends west-south-westward for half a mile to another sandy bay very similar to the former, with shoal water extending for a cable off-shore.

From this latter bay the coast is bold and steep-to, and trends gradually from west-south-west to west-north-west, for a distance of  $1\frac{1}{2}$  miles, to Brothers point. The inland hills are barren and forbidding-looking, being covered with large boulders. Westward of Brothers point the coast turns sharply northward for  $1\frac{1}{2}$  cables, form-

*General charts 1180, 3026, 1962.*

*Chart 3632. Var. 0° 10' E.*

ing a sandy bay, into which flows a small stream and various rivulets. Within the beach sand-flats extend nearly half a mile, within which are cultivated land and villages, the hills falling steeply to the plain on each side. Close westward of this bay is Coxcomb hill, 171 feet high, which slopes, with three crests, to the western point.

**Castle Peak bay**, the next westward, and the southern shore of the channel are described with the eastern shore of Canton river estuary, page 439.

*Charts 1466, Hong Kong; and 1180, Approaches to Hong Kong.*

**HONG KONG.—General remarks.**—Hong Kong island is about 9 miles long, north-west and south-east, 2 to 5½ miles broad, with an area of about 30 square miles, and is separated from the main by Hong Kong harbour, Lye mun, and Tathong channel, the latter being the eastern entrance to the harbour. The appearance of the island is somewhat picturesque, but on the whole generally barren and unprepossessing. It consists generally of rocky ranges, the summit of which, Victoria peak, at the north-western part of the island, is 1,809 feet above high water. A good military road, about 22 statute miles in length, encircles the island. The city of Victoria extends 4 miles along the northern side of the island. The tower of the Hong Kong University, three-quarters of a mile westward of Victoria peak, is a conspicuous object from the harbour.

A full account of the island and its government will be found in the first chapter, pages 17, 18.

The island is indented by numerous bays, the most considerable of which are on its southern side, described later on. There is good anchorage throughout the channel between the island and the main, except in Lye mun, where the water is deep, but the best is in Hong Kong harbour. *See Anchorages*, page 504.

*Charts 3279, 3280, 1459.*

**HONG KONG HARBOUR.—Harbour limits.**—The harbour, as defined by the Port authorities, lies between the northern side of the island and the mainland, and extends between lines drawn from the western end of Green island to the western side of Wan chu chau or Stonecutters island, and from the north point of that island eastward to the Harbour master's station at Sam shui po, on the west, and from North point, on the island of Hong Kong, to the inner end of Kau lung pier, on the east.

Kau lung peninsula projects about 2½ miles southward from the mainland towards Hong Kong. Kau lung bay lies on its eastern and Hongham bay on its south-eastern sides.

Owing to the constant advance in the size, draught, and number of the vessels frequenting the harbour, it is probable that the water space

*Charts 3279, 3280, 1459. Var. 0° 10' E.*

as mentioned will soon be found inadequate for the berthing accommodation required.

As the harbour is only open to the westward, and the effect of westerly gales is mitigated by the large number of outlying islands, it is a very safe anchorage. Vessels can lie secure in the harbour during an ordinary typhoon, and in certain anchorages in the vicinity, but unusually heavy typhoons at times cause great disaster to small craft not provided with the best of ground tackle. *See Harbours of refuge, page 505.*

Vessels on arrival should obtain a copy of the Port regulations from the Harbour office. Extracts from them will be found on pages 512-518.

**Searchlights.**—Signals when inconvenienced by. *See page 18.*

**Navigable depths.**—The harbour is available at all times, both by day and by night. Heavy draughts, or vessels above 24 feet, are recommended to use the eastern entrance, namely, Tathong channel and Lye mun, which has not less than 6 fathoms at low water in the fairway between the sea and the harbour, avoiding charted patches. The western entrance is barred by a flat extending across it within Green island, between Wan chu chau (Stonecutters island) and Hong Kong island, with depths of about 4 fathoms at lowest low water.

The rise of tide is from 6 to 9 feet, but *see page 502.*

*Charts 3280, 1466.*

**WESTERN ENTRANCE. — General remarks. — Depths.**—The western entrance, within Green island, is about  $1\frac{1}{2}$  miles wide between Wan chu chau (Stonecutters island) and the island of Hong Kong, in which space there is a bar stretching right across with a least depth of 4 fathoms at lowest low water, as above mentioned, deepening in the harbour to 6 and 8 fathoms.

The approach by steam craft is usually by Sulphur channel, between Green island and the main, which has a fairway depth of not less than 9 fathoms. Vessels can approach through the Examination anchorage, northward of Kellett bank, in depths of 7 to 8 fathoms, and small craft can cross the bank in from  $3\frac{1}{2}$  to 4 fathoms northward of its shallowest part,  $2\frac{3}{4}$  to 3 fathoms. In any case the bar above mentioned has to be crossed to enter the harbour.

Vessels of deep draught should use the eastern entrance, as before remarked.

**Green island,** about a quarter of a mile in extent, 299 feet high, and wooded, is situated a quarter of a mile north-westward of the north-western end of Hong Kong island. An islet, 83 feet high, lies about half a cable eastward of it.

**LIGHT.**—From a white cylindrical tower, 58 feet in height, on

*General charts 3429, 1180, 3026.*

*Charts 3280, 1466. Var. 0° 10' E.*

the south-western end of Green island, is exhibited at 110 feet above high water, an *occulting white* light, with *red sector*, and a period of *twenty seconds*; eclipse, *three seconds*, and visible 16 miles in clear weather. The keeper's dwelling-house, adjacent, is white. For sectors, *see charts and Light list*.

Various green and red lights are shown from the piers in the harbour, as charted.

**Storm signals** are hoisted at the lighthouse signal station, *see page 510*.

**Telephone.**—The signal station is connected with the Harbour Master's office by telephone.

**Sulphur channel**, between Hong Kong and Green island, though only 2 cables in width, is free from shoals; the least depth in the channel is 9 fathoms, reduced to about 4 fathoms at half a mile within it.

**Kellett bank**, with depths on it of  $2\frac{3}{4}$  to 4 fathoms, is the western portion of the flat which bars the harbour; it extends northward about 2 miles from Green island, and protects Hong Kong harbour from the westward. Light draughts cross it in about  $3\frac{1}{2}$  fathoms beyond a mile northward of Green island.

**Wan chu chau, or Stonecutters island**,  $2\frac{2}{10}$  miles north-eastward of Green island, is nearly a mile long, east and west, a quarter of a mile wide, and 231 feet high within its western extreme.

Landing on Wan chu chau is prohibited except to persons provided with passes.

**Rocks.**—The eastern side of Wan chu chau is foul, and a ledge extends a cable south-eastward from the north-eastern point, with rocks from 2 to 27 feet high on it; a rock awash at low water lies westward of its extreme, and there is a rock 17 feet high off the point south-west of it. A rock which dries 3 feet lies three-quarters of a cable southward of White point, and several small rocks from 3 to 7 feet high lie near the shore north-westward of that point.

**Channel.—Buoys.**—There is a channel between the eastern end of Wan chu chau and Kau lung, barred to the southward by a flat which connects the island to the peninsula, with depths of about  $2\frac{1}{2}$  fathoms. The fairway is between the white buoy, north-eastward of Pinnacle rock, with 3 fathoms, off the north-east extreme of the island, and the white buoy south-westward of Trocas rock, with 3 fathoms.

Hankow rock, with one fathom water, lies near the edge of the 3-fathoms contour, north-east of Trocas rock, with the sheers at the Cosmopolitan dock  $132^\circ$  true, distant  $6\frac{1}{2}$  cables; a white buoy marked "Hankow" is on its north side.

There are a number of buoys off the Cosmopolitan dock, as charted.

**Stonecutters anchorage**, between Kau lung peninsula and Wan chu chau, is much used during the typhoon season, all the

*General charts 3429, 1180, 3026.*



*Charts 3280, 1466. Var. 0° 10' E.*

large junks and many steam vessels taking refuge there on the storm signal being made.

A typhoon refuge harbour is under construction eastward of the anchorage.

**Li chi kok.**—Abreast the north side of Wan chu wan is Li chi kok, a small peninsula on the mainland, off the south end of which land has been reclaimed and a cross-headed pier built, with a depth of about 4 fathoms alongside.

The Standard Oil Company have a dépôt here; there is also the Oriental Brewery, and a Custom-house here.

The watering pier is situated at the north-west side of the peninsula.

A torpedo range, with a floating structure close westward of it, has been established at the west point of the bay westward of Li chi kok.

*Charts 1180, 1466, 3280.*

**Directions.—Western entrance.**—From the southward, having approached Gap rock lighthouse, a usual track is: From about 2 miles westward of Gap rock steer to pass  $1\frac{1}{2}$  miles south-eastward of Hungkong chau, and thence about 2 miles eastward of Lingting island. Then steer northward into West Lamma channel, giving a fair berth to the two rocks north-eastward of Lingting island, one of which is 11 feet high and the other dries 5 feet. In West Lamma channel the deepest water is towards Lamma island.

*Chart 3280.*

The best approach to the harbour for steam vessels of moderate draught is through Sulphur channel. *See Signals* when inconvenienced by searchlights, page 18.

Sailing vessels generally approach Hong Kong harbour from the westward, and either cross Kellett bank or pass northward of it, according to their draught. Sulphur channel should not be taken by sailing vessels, except with a fresh fair wind blowing right through, and as the channel is narrow, it is well to avoid meeting vessels in it.

To proceed northward of Kellett bank from abreast Green island, keep Pok lu chau or Mount Senhouse, the summit of Lamma island, open westward of Green island, bearing  $168^\circ$  true, until within half a mile of Chinghue island, then steer north-eastward and bring Kweiling or Devil's peak, at the Lye mun, in line with White point, the southern point of Wan chu chau bearing  $102^\circ$  true. Keep this mark on until the eastern end of Green island is in line with Shik tongtsui, the eastern point of Hong Kong, bearing  $175^\circ$  true, and then steer south-eastward through the Examination anchorage to the entrance of the Central fairway; *see Fairways*, page 501.

East Lamma channel is shorter than West Lamma for vessels approaching the western entrance to Hong Kong from the south-eastward, page 524.

**At night**, or if approaching from the south-eastward, *see direction* for approaching the eastern entrance, pages 501, 502.

*Charts 3279, 1466. Var. 0° 10' E.*

**EASTERN ENTRANCE.**—Islands and dangers in the approach.—The approach to Tathong channel, the eastern entrance to Hong Kong harbour, is  $4\frac{1}{2}$  miles wide between Wag lan light, on the eastern island of the Pu toi group and South Ninepin north-eastward of it, and is free from dangers, with depths of 15 to 16 fathoms.

*Charts 1466, Hong Kong; also 1180.*

The Lema islands in the offing, with Gap rock lighthouse south-west of them, and also the Ladrone islands, have been described with the approach to Canton river, pages 425-430.

**PU TOI GROUP** lies about 3 miles south-east and southward of Tailong head, west side of entrance to Tathong channel, and the south-east extreme of Hong Kong island.

**Pu toi** (*Lat. 22° 10' N., Long. 114° 16' E.*), the southern and largest of the group, is 794 feet in height, and of barren appearance, there being only a small quantity of brushwood in the valleys. On its south-western side is a rocky islet, 167 feet high, and a boat cove. Eastward of its south point is a rock 18 feet high, and eastward of the small bay on this side is a rock which dries 7 feet on a ridge connected with the shore. Rocks exist near the shore in places, as charted. The island is inhabited.

**Lo chau**, or Beaufort island, lying north-westward of Pu toi, and separated from it by a channel a third of a mile wide, is described on page 520 with the south-western coast of Hong Kong.

**Sun kong**, nearly a mile eastward of Pu toi, is a small uninhabited island covered with grass and small bushes, and rising near its centre to a peak 476 feet high.

**Fury rocks**, 15 feet high, with rocky and uneven ground around, lie 3 cables north-westward of Sun kong, with depths of 8 fathoms between.

**WAG LAN**, about three-quarters of a mile eastward of Sun kong, and the easternmost of this group, is a barren rocky islet half a mile long, north-north-east and south-south-west, about 120 yards wide, and divided into two parts by a small boat passage.

The landing place is at the north-western part of the southern islet, and three buoys, for the use of vessels taking stores to the lighthouse, are moored off it.

**Likin rock**, of small extent, and with 3 fathoms water, lies 2 cables westward of the western point of Wag lan.

Branch shoal is a small rocky patch of 6 fathoms  $1\frac{3}{4}$  cables south-westward of the southern point of Wag lan.

**LIGHT.**—From a round iron tower, 52 feet high, painted lower half white, upper half red, lantern and keepers' dwellings white, situated on the summit of the southern Wag lan islet, is exhibited, at

*General charts 3026, 1962, 3605.*

*Chart 1466, Hong Kong; also 1180. Var. nil.*

an elevation of 225 feet above high water, a *group flashing white light*, showing *two flashes* in quick succession every *thirty seconds*, which should be seen, where not obscured by land, from a distance of 22 miles in clear weather.

**Fog signal.**—A gun at Wag lan lighthouse is fired *twice*, with an interval of fifteen seconds between, *every twelve minutes*, in thick or foggy weather.

**Signal station.—Telephone.**—Communication can be made by the International code of signals with Wag lan lighthouse, which is connected with the Harbour Master's office at Hong Kong by a submarine telephone cable. Storm signals are shown here.

**TATHONG CHANNEL**, the eastern approach to Hong Kong harbour, lies between Hong Kong island and the conspicuous island Lamtong.

**Western shore.—Tai long head**, or Cape d'Aguilar, is the western point of the entrance, and close southward of it are the two green islets, close together, named Kau pui chau, the highest of which is 140 feet high. An old light-tower on the head is conspicuous.

**Signal station.**—There is a signal station on Tai long head.

**Bokhara rocks** are two sunken rocks on a triangular bank of sand and rock about 3 cables in extent, under 10 fathoms, surrounded by depths of 13 to 14 fathoms, and situated on the south-west side of Tathong channel.

South-west rock is a pinnacle with  $2\frac{1}{2}$  fathoms water near the southern part of the bank, and lying  $70^\circ$  true, distant  $6\frac{1}{2}$  cables from the old tower on Tai long head.

North-east rock is a pinnacle with  $3\frac{1}{2}$  fathoms water, situated about  $1\frac{1}{2}$  cables north-eastward of South-west rock.

**Buoy.**—A black and white chequered buoy is moored close westward of South-west rock.

**Clearing marks.**—Taitam head open southward of Kau pui chau leads well southward; western end of Futau chau in line with Talong pai, bearing  $357^\circ$  true, leads westward; Lo chau summit in line with eastern extreme of Kau pui chau,  $201^\circ$  true, leads north-westward; and Pottinger peak in line with Talong pai,  $318^\circ$  true, leads north-eastward of the rocks.

By night, the *white* sector of Hak kok tau light leads eastward of the rocks.

**Mfan chau**, a flat-topped, steep, cliffy islet, 145 feet high, is situated  $1\frac{1}{10}$  miles northward of Tai long head. Two patches close to each other, with  $3\frac{1}{2}$  and  $3\frac{3}{4}$  fathoms water on them, lie 2 cables south-westward of this islet.

**Taito chau**, a steep, cliffy promontory, 174 feet high, covered with low scrub, is situated  $1\frac{1}{2}$  cables northward of Mfan chau. The *General charts 3026, 1962, 3605.*

*Chart 1466, Hong Kong; also 1180. Var. nil.*

coast northward to Hak kok tau is rocky, and landing difficult except in a few places in the coves.

**Shiak o wan** is a rocky and open bight immediately northward of Taito chau. It affords no protection for anchoring, and a heavy swell usually sets into it during the north-east monsoon. The head of the bay is foul.

**Talong pai, or Tathong rock**, a flat rock 6 feet high, and with deep water at the distance of half a cable around it, lies in the fairway of this channel at  $260^{\circ}$  true, about  $1\frac{1}{4}$  miles from Tathong point and 4 cables off Taito chau.

By night, the *white* sector of Hak kok tau light leads eastward of the rock.

**Hak kok tau or Cape Collinson** lies  $1\frac{3}{4}$  miles northward of Taito chau. A ledge of shallow water extends 50 yards off the cape.

**LIGHT** (*Lat.  $22^{\circ} 16' N.$ , Long.  $114^{\circ} 15' E.$* ).—From a white tower over a dwelling-house on Hak kok tau is exhibited, at an elevation of 200 feet above high water, an *occulting* light, with a period of *ten seconds* (light, *seven seconds*; eclipse, *three seconds*). It shows *red* over the channel ( $180^{\circ}$ ), and *white* inshore of the bearings  $338^{\circ}$  true and  $158^{\circ}$  true, and is visible from a distance of 16 miles in clear weather.

**Storm signals** are shown here.

*Chart 3279, Hong Kong waters, East.*

**Sai wan bay** lies nearly a mile north-westward of Hak kok tau, with depths of about 4 fathoms, mud bottom. A rocky ledge extends from the south-eastern point of this bay, with a patch of  $2\frac{1}{2}$  fathoms beyond it; and a rock with 3 feet water lies  $1\frac{1}{2}$  cables north-westward of Kei pi ha, the point north-westward of Hak kok tau and the east point of Ma tong bight. Naiying pai, well open eastward of Hak kok tau extreme, leads eastward of the rocks awash, as does also the *white* sector of Hak kok tau light.

*Chart 1466, Hong Kong; also 1180.*

**EASTERN SHORE of Tathong channel.—Lamtong island**, Tamtu, or Tunglung,  $3\frac{1}{2}$  miles in circumference, and 818 feet high, is separated from the mainland by Fo tau mun. Tathong point, or Lamtong mi, a rocky peninsula 203 feet high, with steep, black cliffs, juts out for about a quarter of a mile on the southern side of the island with which it is connected by a low narrow neck of land.

**Naiying pai**, a flat rock 31 feet high, lies southward of the western point of Lamtong, and one cable off-shore, with reefs inside it.

*General charts 3026, 1962, 3605.*

*Plan of Fo tau mun on 1466. Var. nil.*

**Fo tau mun** is  $1\frac{1}{4}$  cables wide between the rocks which lie off both points to about the distance of a cable, with 3 fathoms water in the channel between patches of 2 fathoms; it is only fit for small vessels.

**Rock.**—On the south side of the eastern approach is a rock awash, at 3 cables south-eastward of the north extreme of Lamtong; it breaks during the north-east monsoon period.

A very remarkable fissure in the high land on the north-eastern part of Hong Kong, a little open southward of the low extreme of the promontory southward of Junk town, leads through the centre of the channel.

*Chart 1466, Hong Kong.*

**Tai miu.—Anchorage.**—There is good anchorage in Tai miu, the bay northward of Lamtong, in about  $5\frac{1}{2}$  fathoms, mud bottom, with the south-eastern extreme of Jan chau bearing  $245^\circ$  true, and the northern extreme of Lamtong  $124^\circ$  true.

*Chart 3279, also 1466.*

**Jan chau (Slope island),** about  $1\frac{1}{4}$  cables in length, is situated off the west point of Tai miu, with which it is connected by a shallow ridge; a rock above water lies off its west extreme, beyond which it is steep-to.

**Futau chau,** or Junk island, situated about a mile northward of Jan chau, is 320 feet high, grassy, with here and there a few low trees. On its north-western side is the Chinese custom house, off which a considerable number of large junks are usually anchored. The island is connected with the mainland on its eastern side by a shallow, rocky ridge, with about 3 feet water over it.

**Siak miu** is the bight immediately north-eastward of Futau chau, in the centre of which there is anchorage for small vessels in 4 fathoms water. Larger vessels anchor northward of Futau chau in  $4\frac{3}{4}$  to 5 fathoms, mud, where good protection is said to be afforded in a typhoon.

**Chung kwang o,** an arm of the sea extending for  $2\frac{3}{4}$  miles northward of Futau chau, gradually contracts in width, and divides into two small bays near its head.

The north-eastern bay is Ap chai wan, with Kam chuk lan, a considerable village, on its shores. The water shoals gradually from 7 fathoms in the southern part of Chung kwang o to 3 fathoms within three-quarters of a mile of its head.

**Tidal streams.**—In Tathong channel the stream sets N.N.W. during the rising, and S.S.E. during the falling tide, the streams

*General charts 1180, 3026, 1962, &c.*

*Chart 3279, Hong Kong waters, East. Var. nil.*

turning at about the times of high and low water. The greatest rate of these streams is one knot.

In Chung kwang o the streams are very weak and irregular.

In Fo tau mun the stream sets N.W. during the rising, and S.E. during the falling tide, with a rate of 3 knots at springs, but its force is only felt in the pass itself, and between Lamtong and Jan chau there is but little stream.

**LYE MUN**, the pass leading from Tathong channel into Hong Kong harbour, between Pak sha wan and Kung am, the north-eastern points of Hong Kong on the south, and Lye mun point and Siu chau wan points on the mainland on the north, is  $2\frac{1}{2}$  cables wide, with depths of 16 to 24 fathoms in the centre. The shores on either side are nearly steep to beyond a distance of about 50 yards.

**Aldrich and Quarry bays.**—Within the southern points is Aldrich bay, the head of which, Sai ki wan, is thickly packed with junks moored in regular lines; there are small building sheds here. Further westward is Quarry bay, and between is the Taikoo dockyard and Engineering Company's docks, ships, workshops, foundry, and all requisites for repairs to steamships, &c. See page 509 and Appendix II., page 560.

**North side.**—On the northern side, within Lye mun, are the small bays of Chong lui and Yau tong, with Kau lung bay farther north-westward.

Westward of the Police station at the west extreme of Quarry bay, shallow water extends about a cable off, to and westward of North point, with rocks in places near the shore, as charted.

**The tidal streams** set straight through the Lye mun, flood north-westward, ebb south-eastward, at the rate of 2 to 3 knots at springs. See Tides, &c., pages 502-503.

**Light.**—A *fixed red* light, which should be seen from a distance of one mile in clear weather, is exhibited from an iron gibbet on a rock close to the beach and near a joss-house at about the centre of the northern shore of Lye mun, at 2 cables westward of Lye mun point.

**DANGERS in Hong Kong harbour.—Rocks.**—Pinnacle rock, with a least depth of 9 feet at low water, lies  $314^{\circ}$  true, distant  $3\frac{3}{4}$  cables from Siu chau wan, the north-west point of the western entrance to Lye mun.

**Light-beacon.**—A white concrete pillar surmounted with a staff and red globe, is erected on the  $1\frac{1}{2}$ -fathoms rock, from which is exhi-

*General charts 1180, 3026, 1962, &c.*

*Chart 3279, Hong Kong waters, East. Var. nil.*

bited a *fixed red* light, which should be seen from a distance of one mile in clear weather.

**Penguin shoals**, detached patches in the fairway of the eastern approach to the harbour within Lye mun, and with their southern end about 2 cables northward of Quarry point, extend about  $3\frac{1}{2}$  cables in a north-north-west and opposite direction, with a breadth of 150 yards. The depth on the shoals is 5 fathoms at lowest low water, over sand and shells, with 6 to 7 fathoms around them.

**Channel rock**, 9 feet high, lies northward of Penguin shoals, and  $342^\circ$  true,  $1\frac{1}{8}$  miles from Quarry point, the north-east extreme of the Taikoo dockyard in Quarry bay. There are some 5-fathoms patches within half a mile south-eastward and southward of it, and a tongue, with depths of  $4\frac{1}{2}$  to 5 fathoms, extends about 7 cables south-westward from the rock; there are many similar patches between this tongue and Kau lung.

Patches of 3 fathoms, with but little deeper water around, lie between Channel rock and the 3-fathoms contour fronting Kau lung bay.

**Kau lung rock**, one foot high, lies on the western side of Kau lung bay just without the 3-fathoms contour line, at about 4 cables eastward of the conspicuous boulder, 72 feet high, and nearly 2 cables off-shore, with which it is connected by a mud-flat.

*Chart 1459, Hong Kong harbour; also 3279, 3280.*

**Buoy.—Rumsey rock**, 4 feet high, lies in Hongham bay, nearly midway between Chinsalchui point and No. 1 Admiralty dock. Some sunken rocks lie north-westward of the Rumsey, the northern of which is marked by a white buoy with a black cross.

**Light-buoy.—Cust rocks**, a sunken patch about two-thirds of a cable southward of Rumsey rock, are marked by a buoy, painted red, with "Cust" in black letters, southward of them; it carries a *fixed red* light.

**Belcher ridge**, with a least depth of 28 feet, lies about  $1\frac{1}{4}$  cables southward of Cust rocks, with depths of 8 to 14 fathoms between.

**Leading mark.**—The *white* sector of Chinsalchui light, leads between Cust rocks and Belcher ridge.

**Rambler shoal**, within a depth of 5 fathoms is 3 cables in extent, with a least depth of 27 feet; it lies about midway between Belcher ridge and North point battery.

**Causeway bay**, fronted by a breakwater 9 feet high, lies eastward of Kellett island; the deepening of it has been completed as a

*General charts 1180, 3026, 1962.*

*Chart 1459, Hong Kong harbour; also 3279, 3284. Var. nil.*

refuge harbour for small craft; see paragraphs on Harbours of refuge and Merchant vessels, pages 505, 506.

**Pier.**—There is a pier about 200 yards in length close north-eastward of Causeway bay eastern entrance, with about 20 feet at low water at its head.

**Kellett island**, 38 feet high, with some buildings and a flagstaff, is about 100 yards in extent, and surrounded by sunken rocks; it lies within the 3-fathoms contour line off East point, at about  $1\frac{1}{2}$  cables northward of the sheers.

**Proserpine rocks**, on the southern side of the harbour, on the outer limits of the foul ground extending off Morrison hill, at about  $3\frac{1}{2}$  cables south-westward from Kellett island, are marked by three white nun buoys, forming a triangle.

**Chinsalchui point.**—**Light.**—From a red brick tower with white lantern, erected on Blackhead hill, Chinsalchui point, Kau lung, close northward of the weather signal staff, is exhibited, at an elevation of 141 feet, a *group flashing red light*, with a *white sector*, showing a group of *three flashes every ten seconds*, and visible from a distance of 6 miles. For details and sectors, see Light list.

**FAIRWAYS.**—**Signal flags.**—There are three fairways through the harbour.

The Southern, the western end of which commences off the gasworks, is bounded on its southern side by the north coast of Hong Kong island, and it terminates 400 feet westward of the Canton steamboat wharf, where it connects with the Central fairway. The north side of this fairway is occupied by junks.

The Central fairway is marked at the western entrance by two mark buoys, painted red and white in horizontal stripes, each showing a small *fixed red light*. This fairway is defined by two lines of buoys extending in an east and westerly direction. These buoys are occupied by the various steamship companies' vessels calling here, as charted.

The line of bearing forming the southern limit of the Northern fairway is the breakwater in Causeway bay open of Kellett island,  $113^\circ$  true. Vessels proceeding through the Southern fairway fly a red pendant, through the Central fairway a white pendant, and through the Northern fairway a blue pendant, or International code flags F, C, D, respectively, at their highest masthead.

*Charts 1180, 1466, 3279, 1459.*

**DIRECTIONS.** — **Eastern entrance.** — Vessels above 25 feet draught should use Tathong channel, the eastern entrance, when entering Hong Kong harbour. Approaching from the southward, Gap rock lighthouse, on the south-west extreme of the Lema and Kaipong islands in the offing, is a good landfall. See views on page 428.

*General charts 1180, 3026, 1962.*



*Charts 1180, 1466, 3279, 1459. Var. nil.*

On a near approach a course may be shaped on either side of these islands in the daytime; at night pass southward of them, hauling up for the entrance, when Wag lan light bears westward of  $338^{\circ}$  true.

From the eastward, Wag lan light, on the south side of the approach, between the bearings of  $236^{\circ}$  true and  $338^{\circ}$  true, will lead in from seaward until Hak kok tau light is seen through the entrance.

Tathong channel and Lye mun are clear and deep, excepting Bokhara rocks and Talong pai, which may be passed on either side, but the main and wider channel is eastward of them. This entrance is used by steam vessels, and sometimes also by sailing vessels during the north-east monsoon, but not usually, as the winds are generally baffling under the high land.

For clearing marks for Bokhara rocks, *see* page 496. At night, Hak kok tau light showing *white* leads eastward of Bokhara rocks, Talong pai and the rocks north-westward of Kei pi ha.

If entering Tathong channel in misty weather, which is not recommended, hug Tathong point, the dark headland of Lamtong, pass it at about 3 cables distance, and steer  $293^{\circ}$  true until the western point of Lamtong is abeam, when alter course to  $338^{\circ}$  true; if it is not desirable to proceed into Hong Kong harbour, haul over towards either shore, out of the fairway, and anchor as convenient, in 9 or 10 fathoms, but this vicinity is of very even depth, and the soundings, except within the line of projecting points, do not decrease, so caution is necessary in approaching the shore.

When through Lye mun, avoid the 9-feet rock northward of the western end of the pass and marked by a light-beacon; pass on either side of Penguin shoals, and give a sufficient berth to the shallow water extending off the island northward and eastward of North point, thence to the anchorage.

For vessels of very heavy draughts, a good mark for passing between Belcher ridge and Rambler shoal is the south-east extreme of Kingsclere, a conspicuous yellow house on the slope of Victoria peak, in line with the Dockyard electric light station, bearing  $235^{\circ}$  true; the depth is not less than 31 feet on this line.

AT NIGHT.—Heavy-draught vessels should use the passage between Cust rocks buoy, with *red* light, and Belcher ridge, in the *white* sector of Chinsalchui point light, then steering south-westward for the anchorage. *See* Extracts from Port Regulations, pages 512-518.

*See* Signals when inconvenienced by searchlights, page 18.

**TIDES.**—The tides at Hong Kong are very complicated, being influenced by a large diurnal inequality or difference in height of high and low waters of each succeeding tide, which inequality varies throughout the lunation, from nothing at about neaps, to its greatest amount at springs, when there is practically only one tide in the day; but the actual minimum range of the smaller tide does not always occur precisely at springs.

*General charts 3026, 1962, &c.*

*Charts 1180, 1466, 3279, 1459. Var. nil.*

The tides are also affected by the winds, which may increase or diminish the range by one foot or more.

The highest tide of the day nearly always precedes the lowest tide; that is to say, the sequence of the movements is as follows: Fall from the higher high-tide to the lower low-tide, then rise to the lesser high-tide, then fall to the higher low-tide, whence it rises to the higher high-tide level. For a few days, about neaps, the sequence becomes reversed.

When the sun has north declination, the higher tides about springs occur during the day; and when the sun has south declination, during the night, spring tides occurring at about 10 o'clock. High water at full and change is about 9 o'clock.

The range of spring tide is at its maximum, 9 feet, shortly after the sun attains its greatest declination, north or south; and the minimum, about 6 feet, at the equinoxes.

The range of one spring tide during a lunation is generally greater than the other, and when this occurs the greater range is always caused by the high water following the inferior transit of the moon, and the low water next succeeding. This is usually at full moon when the sun has south declination, and at new moon when the sun has north declination.

Times at which the greater high tide at Hong Kong occurs in the several months of the year:—

January - 5 p.m. to midnight.	July - 5 a.m. to 1 p.m.
February - 3 p.m. to midnight.	August - 3 a.m. to noon.
March - Noon to 11 p.m.	September - Midnight to 10 a.m.
April - 9 a.m. to 6 p.m.	October - 10 p.m. to 9 a.m.
May - 7 a.m. to 5 p.m.	November - 6 p.m. to 6 a.m.
June - 6 a.m. to 3 p.m.	December - 6 p.m. to 3 a.m.

The highest night tides, which occur between October and January, rise about one foot higher than the highest day tides, which latter occur from May to September. *See notes on the charts.*

**Tide pole.**—A tide pole is situated at the entrance of the new basin at the Royal Naval Yard.

**Tide tables** for Hong Kong are published in the Admiralty tide tables.

**Tidal streams.**—In the fairway of the channel and harbour between Lye mun and Green island the stream sets westward with a rising, and eastward with a falling tide, changing in direction at about high and low water. The rate at times reaches 2 knots, and in Lye mun as much as 3 knots with favourable winds and tides. At the *Tamar's* moorings it is from one to 2 knots, and off the dry dock as

*General charts 1180, 3026, 1962.*

*Charts 1180, 1466, 3279, 1459. Var. nil.*

much as 3 to  $3\frac{1}{2}$  knots has been observed during the westerly stream, and a nasty sea is caused between No. 6 buoy and the wall of the basin at times (*Minotaur* Remark Book, December, 1910). During the strength of the stream it must be guarded against when going to a buoy. In the various bights the tidal stream is weak and irregular.

**Pilots.**—There are no licensed pilots at Hong Kong, but most shipping firms have their own pilots.

Pilots for Macao, Canton, and West river can be obtained at Hong Kong.

*Chart 1459, Hong Kong harbour; also 3279, 3280.*

**ANCHORAGES.**—By the port regulations vessels are berthed under the superintendence of the Harbour Master; the harbour limits are mentioned on page 491.

The usual anchorage for merchant vessels is abreast the city; anchorages are reserved for His Majesty's vessels eastward of the city, and on the western side of Kau lung peninsula.

Foreign men-of-war moor in Kau lung bay, eastward of the prohibited anchorage, northward of a line drawn  $81^\circ$  true from Chinsal-chui signal station, and southward and westward of the 5-fathoms contour line, within which limits there are berths for 14 vessels. The depth is from 3 to 13 fathoms, good holding ground.

During the typhoon months the northern part of the harbour is considered preferable in consequence of the shelter afforded by Kau lung peninsula north-eastward, from which direction the wind blows hardest. Harbours of refuge for small craft, *see* page 505.

Vessels are prohibited from throwing ashes overboard anywhere within Hak kok tau to the eastward and within a line joining Green island and Kau chau to the westward. Masters of vessels should obtain copies of the Port Regulations. *See* Extracts from them on pages 512-518.

**Moorings** are laid down off the Royal Naval Yard, Hong Kong, and off the Royal Naval Depôt, Kau lung, for the use of His Majesty's vessels.

Mooring buoys for merchant vessels are laid in lines running in an east-south-easterly direction.

The limits of the anchorages and positions of the mooring buoys are shown on the plans.

**Examination anchorages.**—There is an Examination anchorage in Chung kwang o in the eastern entrance, and also westward of Wan chu chau or Stonecutters island, in the western entrance. *See* Notice to Mariners, No. 1, of the year inside cover of this volume.

*General charts 1180, 3026, 1962.*

*Chart 1459, Hong Kong harbour; also 3279, 3280. Var. nil.*

**Prohibited anchorages.—Lights.**—The cable ground between the north point of Hong Kong island and the south-east point of Kau lung peninsula is marked as follows:—

Two white beacons on the shores of Kau lung and Hong Kong island, and two white masonry obelisks, situated north-westward and south-eastward of them, respectively; when the beacons are in line with the obelisks, bearing  $333^{\circ}$  true and  $153^{\circ}$  true, respectively, they indicate the boundaries of the cable ground by imaginary lines  $1\frac{1}{2}$  cables apart, within which anchorage is prohibited.

By day the four beacons forming the front marks may be distinguished by their each carrying a red diamond-shape; by night, each displays a *red* light.

The lights are so screened that the easternmost lights do not show to the eastward nor the westernmost lights to the westward of the prohibited area; when, therefore, the two lights on the same side are visible at the same time, vessels must proceed until one or other of the lights is obscured before anchoring.

The submarine cable between Tai kok tsui and the eastern part of Wan chu chau is marked by a white post with red diamond shape at each end.

No vessel of any description shall anchor within 50 yards on either side of this cable.

**Quarantine anchorage.**—The quarantine anchorage is within the following boundaries: Western boundary, a line from the western side of Green island to the western side of Wan chu chau; southern boundary, that part of a line having the Naval coal sheds at Kau lung, bearing  $101^{\circ}$  true, lying between the eastern and western boundaries; eastern boundary, a line drawn  $180^{\circ}$  true from a white mark on Wan chu chau or Stonecutters island to the southern boundary; northern boundary limit is the depth of 5 fathoms. *See also Quarantine regulations in the extracts from the Port regulations, pages 513-516.*

**“Dangerous goods anchorage,”** *see* Port regulations, page 513.

**Harbours of refuge.**—1. The harbours of refuge in Causeway bay and elsewhere in the colony are for the purpose of affording shelter to small craft during bad weather, and are not to be used at any other time without the special permission of the Harbour Master.

2. No vessel, as long as any space remains vacant in a harbour of refuge, shall anchor, secure, or lie in such a position as may obstruct the free access of other vessels to such vacant space.

3. No vessel shall be prevented from using any recognised pier or landing place within the limits of a harbour of refuge, for the purpose of landing or embarking cargo or passengers, so long as such vessel

*General charts 1180, 3026, 1962.*

*Chart 1459, Hong Kong harbour; also 3280.*

shall not remain within such limits longer than is absolutely necessary for such purposes.

**Merchant vessels** arriving in the colony are only permitted to anchor in the following ports: Victoria (within harbour limits), Aberdeen, Sai ki wan (Aldrich bay), Fo tau mun (Tai mui), Kap sing mun, Chung chau, Tai ho (Lantau), Tai po (Tolo harbour), Deep bay, and Sai kung (Port Shelter). *See Extracts from Port Regulations, pages 512-518.*

**Harbour works.**—Reclamation and sea wall extension works are in progress, as charted from latest information, and vessels must not approach the said works within 50 yards. The new ferro-concrete piers at Kau lung city and at the gunpowder depôt on Green island were completed in 1910, as well as the deepening of Causeway bay.

A typhoon refuge is being constructed southward of the Cosmopolitan dock, by enclosing the bight between it and Yau ma ti; there will be an entrance at either end of a detached breakwater. *See chart 3280.*

**Wharf lights.**—*Green or red* lights mark the extremes of the principal wharves or piers on both sides of the harbour, as charted.

**ROYAL NAVAL YARD** is situated close eastward of the city and nearly abreast Kau lung point on the opposite shore. It has a tidal basin of about 9 acres, with a depth of 33 to 35 feet near the centre and not less than 30 feet alongside. Within and on either side of the basin are cranes, workshops, electric power and pumping stations, barracks, storehouses, docks, cambers, boat slips, &c.

**Dry dock.**—The new Admiralty dock, No. 1, for docking the largest vessels, is situated close westward of the basin. *See Appendix II., page 559.*

**Lights.**—The entrance to the basin is marked by *fixed red* lights, one on each side.

**Traffic regulations.**—When the following signals are exhibited from a flagstaff situated near the head of the outer arm of the basin, these regulations are to be observed:—

1. When a vessel is about to enter or leave the basin a *red* flag will be exhibited, and all vessels passing in the vicinity must proceed northward of the docking buoys and of the line formed by buoys Nos. 6, 6a, and 11.

2. When a vessel is about to enter or leave the dry dock a *blue* flag will be exhibited, and all vessels must pass northward of the northern line of buoys in the man-of-war anchorage. When submarines are taking in petrol at the Asiatic Petroleum Company's wharf at Tai Kok tsui, about a mile northward of the Royal Naval Depôt, a red flag will be hoisted at the flagstaff at the pierhead, also red flags will be placed on the buoys to north and west-north-west of such pier. No ship, launch, or other vessel shall approach this wharf within 250 yards

*General charts 1180, 3026, 1962.*

*Chart 1459, Hong Kong harbour; also 3280. Var. nil.*

of such when the red flags are hoisted, and all traffic shall pass to the westward of the buoys when flying red flags.

**The chimney**, 183 feet high, at the electric power station in the Royal Naval Yard, is a conspicuous object.

**The torpedo depôt** is the Royal Naval Dépôt, charted on the west side of Kau lung peninsula. Fronting it is a camber dredged to a depth of 10 feet, with *red* and *green* lights at the entrance, and northward of it is the coaling camber, formed by a breakwater with a coaling jetty at its outer end, with *green* light at its extreme. Southward of the depôt are the coaling wharves mentioned with coal on page 508.

*Chart 3280; 1466.*

**The torpedo mine-field** is periodically laid southward of Wan chu chau, the obstructed area being marked by buoys carrying red flags; the eastern buoy lying about 700 yards 180° true of the south-eastern point of the island, and the western buoy about 700 yards 270° true of the eastern buoy—all vessels must keep southward of these buoys.

Obstructions are also sometimes placed northward of Wan chu chau, in an area bounded on the west by a line from the northern point of the island to the watering pier at Li chi kok, and on the east by a line drawn 22° true from the Government pier to the mainland.

A torpedo range has been established at the point westward of Li chi kok, as mentioned on page 494.

**SIGNAL STATIONS.**—There are signal stations on Victoria peak, Green island, and Blackhead hill, Kau lung, near Chinsalchui lighthouse. The Commercial code is used.

**Time signal.**—This signal is made daily (except on Sundays and Government holidays) from a mast about 100 feet high north-west of the signal station on Blackhead hill, near Chinsalchui lighthouse, Kau lung peninsula.

A ball is hoisted half-way up at 0h. 55m. p.m., close up at 0h. 57m. p.m., and dropped by electricity from Kau lung observatory at 1h. 0m. 0sec. Hong Kong standard time, corresponding to 17h. Greenwich mean time. Should the signal fail the ball is slowly lowered, and, if possible, rehoisted and dropped at 2h. 0m. 0sec. Hong Kong standard mean time. The standard time of 120° E. or 8 hours fast of Greenwich has been adopted at Hong Kong.

**Position.**—The signal station is situated in lat. 22° 17' 52" N., long. 114° 10' 26" E., and the transit instrument at the Observatory, Kau lung peninsula, is in lat. 22° 18' 13" N., long. 114° 10' 25" E.

**Magnetic observations.** — The magnetic observatory is a suitable place for magnetic observations, the only place noted as such in this volume. See page 568, Appendix V.

*General charts 1466, 1180, &c.*

*Charts 3279, 1466. Var. nil.*

**Measured distances.**—A measured distance of 6,055 feet, for trying the speed of steam vessels, is in the north-eastern part of the harbour, on the west side of Kau lung bay, the leading mark for which is Wanchai gap in line with the summit of Kellett island, bearing 213° true.

The mark for the south-western limit is the southern boulder of a barren hill in line with the head of Kau lung dock sheers, bearing 301° true, and the mark for the north-eastern limit is White patch, at the quarries, in line with Kau lung rock, 298° true. There is also a measured distance in East Lamma channel, page 525.

*Charts 1459, Hong Kong harbour; also 3279, 3280.*

**The city of Victoria** is situated on the north side of Hong Kong island, and occupies nearly the whole of it, between Kellett island and the west extreme of Hong Kong island. It is fronted by numerous wharves belonging to the several shipping companies; the principal ones are marked by lights.

**Supplies.**—Stores and provisions of every kind can be obtained in abundance, and there is a well-regulated market. Excellent water from the waterworks is supplied to the city and shipping; there is a reservoir containing 33,000,000 gallons at Wong nei chung gap.

Works are in progress for supplying Kau lung peninsula with water by gravitation.

**Hospital, &c.**—There is a good hospital for seamen, a well-conducted sailors' home, and a naval seamen's club. There are also three Government hospitals in the city, besides others. There is an observation station capable of accommodating 1,500 persons in the event of an outbreak of infectious disease in a vessel arriving in the harbour. Infectious diseases are treated in the Kennedy town hospital.

**COAL.**—A very large quantity of coal is kept at the Naval dépôt at Kau lung, and also by local firms.

**Coaling wharves.**—Vessels of 20 feet draught can lie alongside the western side of the jetty forming the Torpedo boat camber at Kau lung by placing lighters of 20 feet beam between them and the wall; the length of berthing is 540 feet; 22 feet is the least depth shown on the plan.

At the three piers (North, Middle, and South) southward of the camber there is berthing for six vessels of deep draught, as chartered, and of 450 to 600 feet in length. North pier, destroyed, is to be re-constructed.

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

Vessels of 20-feet draught, and 400 feet long, can be coaled alongside the sea wall northward of the three above piers, by placing lighters of 25-feet beam between them and the wall.

His Majesty's ships are coaled from lighters. There is a plentiful supply of junks, and some 130 launches suitable for towing.

There is a depth of  $28\frac{1}{2}$  feet alongside the coaling pier at Chinsalchui point.

Vessels cannot coal alongside any of the wharves on the Hong Kong side of the harbour, but coal can be obtained in lighters from the Wanchai coal godown. Northerly gales and typhoons impede coaling.

**Docks.**—At the Royal Naval Yard is a new dry dock, No. 1, capable of docking the largest of H.M. vessels, as before mentioned.

The following docks are the property of the Hong Kong and Whampoa Dock Company, Ltd.: Kau lung docks, east side of Hongham bay; Nos. 1, 2, and 3 docks. There are also two patent slips.

On Kau lung, eastward of Wan chu chau or Stonecutters island, is Cosmopolitan dock.

In Aberdeen harbour, or Shek pai wan, south side of Hong Kong island, is Hope dock and Lamont dock. Hope and Lamont docks are used principally for cleaning and painting ships' bottoms.

At Quarry bay are the dock and slips of the Taikoo Dockyard and Engineering Company.

For details of the docks, *see* Appendix II., page 560.

**Repairs.**—The Hong Kong and Whampoa Dock Company's Kau lung and Cosmopolitan establishments possess every appliance and facility for both the construction and repair of ships and machinery, under the supervision of European foremen. Vessels of 4,000 tons have been built. The machinery and plant at their Aberdeen establishment is not very extensive.

There is a length of 1,000 feet of wharfage in Hongham bay, with a depth alongside of 5 to 45 feet, and steam sheers of 100 and 15 tons; and at the Cosmopolitan dock 550 feet of wharfage, with depths of 8 to 15 feet alongside, but deepening rapidly off, and there are steam sheers of 20 tons.

The Taikoo Dock Company, in Quarry bay, has a boiler shop, foundry, &c., and all appliances for repairs to machinery, &c. The large crane will lift a weight of 100 tons.

**Railway.**—The Kau lung-Canton railway was opened in 1911; 21.78 miles are in British territory; it passes along the western shores of Tide cove and Tolo harbour, Mirs bay, to Sam chun on the frontier. There are over 9 miles of tramway lines in the city of Victoria.

*General charts 1466, 1180, &c.*



*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

**Communication.**—See page 18. Hong Kong is connected by submarine cable with Singapore, viâ Saigon, and also viâ Labuan, also with the principal China ports northward. It is also connected with the local lighthouses.

Numerous mail steamers make it a port of call.

**Trade and shipping.**—Hong Kong being a free port it is impossible to give any correct statistics of its trade, but its enormous extent may be approximately estimated from the fact that shipping numbering 547,164, of a total tonnage of 36,534,361 tons, entered and cleared during 1910; these totals are the largest yet reached. British ocean-going vessels represented 10·5 per cent., and British river steamers 16·0 per cent. The average tonnage of ocean vessels visiting the colony has risen from 1,179 tons to 2,457 tons during the past 20 years. The number of fishing craft is estimated at 15,500.

The principal articles of import are coal, rice, sugar, and flour; the principal exports are tea, kerosene oil, rice, paddy, and general cargo.

The industries of the colony include dock work, launch and boat building, cement manufacture, paper making, sugar refining, brick and tile making, rope making, iron foundries, boiler making, glass manufacture, vermilion manufacture, and opium boiling. A considerable part of the boat-population is engaged in deep-sea fishing.

**Fire.**—The fire brigade of Hong Kong possess a powerful floating fire engine for use in the harbour.

**STORM SIGNALS.**—The storm signals at Hong Kong are made from a mast in front of the Water Police Station at Kau lung point, but do not necessarily imply that bad weather is expected at Hong Kong. These signals are in addition to those given on pages 32-37 of this volume and to the Forecasts referred to on page 512, which are shown from Blackhead hill.

**DAY SIGNALS.**—1. A cone, point upwards, indicates a typhoon to the north of Hong-Kong.

2. A cone, point upwards, and drum below indicates a typhoon to the north-east of Hong Kong.

3. A drum indicates a typhoon to the east of Hong Kong.

4. A cone, point downwards, and a drum below indicates a typhoon to the south-east of Hong Kong.

5. A cone, point downwards, indicates a typhoon to the south of Hong Kong.

6. A cone, point downwards, and a ball below indicates a typhoon to the south-west of Hong Kong.

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

7. A ball indicates a typhoon to the west of Hong Kong.

8. A cone, point upwards, and ball below indicates a typhoon to the north-west of Hong Kong.

*Red signals* indicate that the centre is believed to be more than 300 miles away from the colony.

*Black signals* indicate that the centre is believed to be less than 300 miles away from the colony.

The above signals will, as heretofore, be hoisted only when typhoons exist in such position or are moving in such directions that information regarding them is considered to be of importance to the colony or to shipping leaving the harbour.

These signals are repeated at the Harbour Master's office, situated near the Canton steamboat pier, at H.M.S. *Tamar*, Green island signal mast, and the flagstaff on the premises of the Hong Kong and Kau lung wharf and Godown Company at Kau lung.

Notice boards are placed at the Cable Company's offices, Ferry Company's pier, Blake pier Post-office, Harbour office, and Ferry Company's pier, Kau lung. Daily Meteorological Observations are posted at same place.

**URGENT SIGNAL.**—In addition to the above, when it is expected that the wind may increase to full typhoon force at any moment, the following urgent signal will be made at the Water Police Station and repeated at the Harbour office:—*Three explosive bombs, at intervals of ten seconds.*

A black cross will be hoisted at the same time, above the other shapes.

**NIGHT SIGNALS.**—The following night signals will be exhibited from the flagstaff on the roof of the Water Police Station at Kau lung, the Harbour office flagstaff, Hong Kong, and H.M.S. *Tamar*:—

1. Three lights vertical, *green, green, green.* Indicates that a typhoon is believed to be situated more than 300 miles from the colony.

2. Three lights vertical, *green, red, green.* Indicates that a typhoon is believed to be situated less than 300 miles from the colony.

3. Three lights vertical, *red, green, red.* Indicates that the wind may be expected to increase to full typhoon force at any moment.

No. 3 signal will be accompanied by the explosive bombs, as above, in the event of the information conveyed by this signal being first published by night.

The above night signals will be substituted for the day signals at sunset, and will, when necessary, be altered during the night.

**SUPPLEMENTARY WARNINGS.**—For the benefit of native vessels and passing ocean vessels, a cone will be exhibited at each of the following

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

stations during the time that any of the above day signals are hoisted in the harbour:—

Gap rock, Sau ki wan, Wag lan, Sai kung, Stanley, Sha tau kok, Hak kok tau or Cape Collinson, Aberdeen, and Tai po in Mirs bay.

This will indicate that there is a depression somewhere in the China sea, and that a storm warning is hoisted in the harbour.

Further details can always be given to ocean vessels, on demand, by signals, from the lighthouses.

**Forecasts of weather**, according to the Shanghai code, pages 33-36, are exhibited by signals from the flagstaff on Blackhead hill, and further information can be obtained at any time by telegraphing or telephoning (free) from the Cable company's office in Connaught road or from Kau lung police barracks to the Observatory.

**Outward-bound vessels.**—When the red drum is hoisted, steamships, if bound to northern, western, or southern ports, should leave at once, and may expect more or less fine weather; if bound for the Philippine islands they may expect to encounter the typhoon. Sailing ships bound for southern and western ports may sail immediately; but those bound to northern or eastern ports should remain in harbour, and await further information, even if the wind be westerly at the time.

When the cone, point upwards, is hoisted, south-westerly winds may be expected, and ships leaving harbour are not likely to run any risk from the typhoon; sailing vessels, bound northward, should sail as soon as convenient, to benefit by the south-west breeze.

When the cone, point downwards, is hoisted, to avoid bad weather, ships should remain in port until the barometer rises, when danger from the typhoon is past.

When the ball is hoisted, ships leaving for northern, eastern, or southern ports may expect winds from East, round by south, to S.W. Those leaving for western ports run no risk while the barometer continues rising; should the barometer fall, they should be hove-to, and subsequently take refuge in some typhoon harbour, but this will rarely occur.

EXTRACTS FROM PORT REGULATIONS (taken from China Coasters' Manual, 1911, published annually.)

#### DANGEROUS GOODS.

15.—(3) For the purpose of this Ordinance the expression "dangerous goods" means aquafortis, vitriol, naphtha, benzine, gunpowder, lucifer matches, nitro-glycerine, petroleum, dynamite, gun-cotton, fulminate of mercury or of other metals, blasting powders, cheddite,

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

gelignite, gelatine dynamite, blasting gelatine, bobbinite, and compressed gunpowder, fireworks, fuses, rockets, percussion caps, detonators, cartridges, ammunition of all descriptions and any other goods which are from time to time declared by the Governor in Council to be of a dangerous nature.

(4) The master or owner of any ship may refuse to take on board any package or parcel which he suspects to contain goods of a dangerous nature, and may require it to be opened to ascertain the fact.

1.—Any ship or vessel arriving at this port having on board any dangerous goods within the meaning of the above-mentioned Ordinance or to which such Ordinance applies, and any ship or vessel to take on board any such goods for exportation, shall hoist a *red flag* at the fore-top-gallant mast-head and shall keep it flying until such goods are removed from or received into such ship or vessel.

2.—Every ship, vessel, lighter or boat of any description whatever, having on board any dangerous goods as aforesaid, shall, whilst in the waters of the Colony, hoist a *red flag* at the fore-top-gallant mast-head, or, where there is only one mast, at that mast-head, or, where there is no mast, on a pole at her bows.

9.—The “Dangerous Goods Anchorage” shall (unless and until the Governor shall by notification in the *Government Gazette* appoint some other anchorage in addition to or in lieu of such anchorage) mean that portion of the harbour waters being within the following limits:—

Eastward of a north and south line, drawn through Kellett island.

South of a line drawn from the chequered buoy marking the west edge of the men-of-war anchorage to North point of Hong Kong.

Bounded on the east by the western edge of the telegraph cable ground.

#### QUARANTINE REGULATIONS.

##### *Under Section 23.*

1.—In these regulations, the term “Health Officer” means the Health Officer of the Port, or any other medical officer, duly authorised to act for, or assist him, or in charge of any place set apart for the detention and seclusion of persons actually suffering from disease; the term “Vessel” includes British and foreign ships of war, as well as all other vessels; the term “port or place of which any infectious or contagious disease prevailed” means a port or place proclaimed to be such by order of the Governor in Council published in the *Gazette* from the date of such proclamation. The words “infectious or con-

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

“contagious disease” shall, for the purposes of these regulations, mean cholera, choleraic diarrhoea, small-pox, typhus fever, yellow fever, bubonic plague, and any such other epidemic disease as the Health Officer may consider to imperil the safety of the passengers or crew. The term “infected vessel” shall mean any vessel which has a case of any of the above-mentioned diseases on board or on which one or more cases of any such diseases shall have occurred within a period of twelve days previous to the date of arrival of the vessel in the waters of the Colony, except in the case of cholera when such period shall be seven days instead of twelve; the term “suspected vessel” shall mean any vessel on which one or more cases of any of the above-mentioned diseases shall have occurred at the time of departure or during the voyage, but on which no fresh case has occurred within a period of twelve days, or in the case of cholera seven days, previous to the date of arrival of the vessel in the waters of this Colony; the term “healthy vessel” shall mean any vessel which, having come from a port or place at which an infectious or contagious disease prevailed, has had no death from, and no case of any such disease on board while at such port or place or during the voyage therefrom, or on arrival.

2.—Every “infected,” every “suspected,” and every “healthy” vessel on entering the waters of this Colony shall fly and keep flying a yellow flag (letter Q in the International Code of Signals) and shall not communicate with the shore until granted pratique by express written order of the Health Officer who shall board every such vessel and shall examine all the passengers and crew thereof. Provided, nevertheless, that any such vessel, which is on a voyage to any other place and which has held no communication with the shore except as permitted by these regulations, may, with the written consent of the Health Officer, proceed on such voyage or tranship her passengers for the purpose of completing such voyage.

3.—Every “infected,” every “suspected,” and every “healthy” vessel shall, unless previously granted pratique, proceed at once to the Quarantine anchorage and shall not remove therefrom, except from stress of weather, until released by order of the Health Officer. No vessel which is compelled to leave the Quarantine anchorage from stress of weather shall communicate except by signals with the shore or with any other vessel, and such vessel shall return to the Quarantine anchorage immediately such stress of weather has subsided: Provided that in case of stress of weather involving probable actual danger to the vessel, the vessel may remove for a time, but shall be deemed, nevertheless, for all purposes to be subject to all other regulations applicable to such vessels.

No such vessel shall enter the harbour limits before 6 a.m. or after 6 p.m.

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

4.—The Quarantine anchorage shall be within the following boundaries, and the master of every vessel shall remove his vessel to any part of the Quarantine anchorage as and when required by the Harbour Master:—

*Western Boundary.*—A line drawn from the western side of Stonecutters island to the western side of Green island (on the Admiralty chart marked as the harbour boundary).

*Southern Boundary.*—That part of a line having the Naval Coal Sheds at Kowloon bearing  $101^{\circ}$  true, commencing where it meets the eastern boundary, and terminating where it meets the western boundary.

*Eastern Boundary.*—A north and south line,  $180^{\circ}$  true, drawn from a white mark on south side of Stonecutters island until it reaches the southern boundary.

*Northern Boundary.*—The 5-fathoms line of soundings.

15.—Where a vessel has passengers on board who are in a filthy or otherwise unwholesome condition, or is overcrowded with passengers, emigrants or otherwise, the Health Officer may, if in his opinion it is desirable with a view to checking the introduction of any infectious or contagious disease, and on his certifying to that effect, order such vessel to proceed to the Quarantine anchorage, or to such place as he may direct, and may detain under observation or surveillance the passengers and crew for such period, not exceeding ten days from the arrival of the vessel, as he may direct: and if the vessel is also an “infected” or “suspected” vessel, the measures prescribed in regulation 6 (a) and (b) respectively may also be enforced.

16.—Any costs and expenses charged or incurred by the Government for the medical attendance and maintenance of any person, whether on the ship's articles or not, who is removed to the *Hygerta*, or any other hospital or place from any vessel, under these regulations, for medical treatment or surveillance, or for the burial of any person who may die on any vessel, or of any dead body found on board any vessel, or for the cleansing and disinfection of any vessel or of the merchandise on board any vessel, or of any part of the vessel or of her merchandise, including the hire of any necessary labour, boats, junks, hulks, premises on shore and disinfecting appliances shall be paid to the Government on demand by the owners or agents of the vessel.

19.—The preceding regulations (with the exception of Nos. 15 and 16) shall not apply to any vessel which has on board as surgeon or medical officer a medical practitioner who is entered on the articles of agreement or any similar document, if after entering the waters of this Colony the master of the vessel signs a certificate, in the form A appended to these regulations, to the effect that there has been no

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

sickness of an infectious or contagious nature on board such vessel within a period of twelve days previous to the date of arrival of the vessel within the waters of this Colony, and if the surgeon or medical officer of the vessel after entering the waters of this Colony signs a certificate, in the form B appended to these regulations, to the same effect, with the addition that he has seen every person on board such vessel within the twelve hours immediately preceding his signature thereto. In default, however, of either of such certificates being signed the preceding regulations shall apply.

Any master, and any surgeon or medical officer of any such vessel who shall sign any such certificate as aforesaid containing any false statement and any person signing any such certificate as surgeon or medical officer of the vessel when not duly entered on such articles or document as aforesaid shall be deemed to be guilty of a breach of these regulations and may be proceeded against and punished accordingly.

24.—No vessel of any description, whether a ship of war or otherwise, shall be allowed to anchor within any fairway which shall be set apart by the Harbour Master for the passage of vessels, and the master, or any other person in charge of any boat or other vessel dropping anchor in, or otherwise obstructing such fairway, shall for each offence be liable to a penalty not exceeding fifty dollars, and in default of payment to imprisonment with or without hard labour not exceeding one month.

(3) In the case of Police assistance being required on board any ship, owing to an outbreak of fire, or to a riot or disturbance which the master and his officers are unable to quell, if by day, the signal flag S of the Commercial Code shall be hoisted, and, if by night, three lights in a vertical line, the highest and lowest red and the middle light white; the day signal may be supplemented by the signal NM, "I am on fire," or YF, "Want assistance—mutiny," and the night-signal by a "Flare-up" every minute in the case of fire, or "Blue lights" in the case of disturbance. A continuous sounding with any fog signal apparatus may, in addition, be adopted to attract attention in either case.

(Fairways and anchorages are referred to in the preceding pages 501, 504-506.)

#### EXPLOSIVES.

36.—(3) It shall not be lawful for the master of any vessel, without the permission of the Harbour Master, to anchor such vessel within 500 yards of any Government Gunpowder Depot.

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

(6) The master of every vessel having on board as cargo gunpowder, or other explosives, and whilst engaged in the transshipment of the same, shall exhibit a red flag at the highest mast-head.

(7) It shall not be lawful for the master of any vessel, having on board as cargo gunpowder or other explosives, to anchor within 500 yards of any other vessel except by permission of the Harbour Master.

(9) No gunpowder or other explosives shall be shipped, landed, or transhipped, within the waters of the Colony, between the hours of 6 p.m. and 6 a.m. from October to March inclusive, nor between the hours of 7 p.m. and 5 a.m. from April to September inclusive, nor between the hours of 7 p.m. and 5 a.m. from April to September inclusive, without the written permission of the Harbour Master.

(7) The expression "Gunpowder Anchorage," as used in this section, shall mean the anchorage on the south side of Stonecutters island (Wan chu chau) to the west of a line from which the White Rock bears 0° true, and to the north of a line from which the sheers at the Kowloon (Kau lung) Naval Yard bear 90° true.

#### GOVERNING CASE OIL.

Every vessel arriving at any port in this Colony having on board case oil, and every vessel being about to take on board such oil from licensed premises, shall hoist a red flag at her fore truck, and the flags T H E of the International code (signifying "Petroleum Oil") at her main truck, and shall keep such flags flying during the hours of daylight whilst any petroleum is on board, and thereafter until the Harbour Master is satisfied that the holds are clean and ventilated. And during the same period every such vessel shall by night display two *red* lights vertically, where best seen, and at a height of not less than twenty feet above the deck.

2A.—No case containing petroleum in a leaky or damaged condition shall be shipped or transhipped in any port in this Colony, and should any such leakage be found to have taken place from cases already shipped on board of any vessel, it shall be lawful for the Harbour Master to cause such vessel to be removed, at the expense of the owner, agent, or master thereof, to such place as he may deem necessary to safeguard the interests of the harbour.

3.—Every vessel having on board case oil shall anchor either in the petroleum anchorage south of Stonecutters island, or in the dangerous goods anchorage east of Kellett island, and shall obtain permission from the Harbour Master before going alongside any wharf, or shifting berth.

The Standard Oil Wharf at Lap sap wan, the Royal Dutch Petroleum

*General charts 1466, 1180, &c.*



*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

Company's Wharf at North point, Messrs. Arnhold, Karberg, and Co.'s Wharf at Tai kok tsui, and such other places (if any) as the Governor in Council may by notification in the *Gazette* appoint, shall be the places to which vessels having, or being about to take on board, case oil, may proceed, with the permission of the Harbour Master. Otherwise such case oil must be discharged or taken in, in the petroleum anchorage south of Stonecutters island, or in the dangerous goods anchorage east of Kellett island.

8.—No discharge of petroleum, whether mixed with water or not, shall be permitted into the harbour from any ship, or boat, lighter or vessel conveying case oil, or from the licensed premises.

9.—Smoking and the use of any light or fire in any boat, lighter or vessel, which is used for landing case oil, are prohibited.

10.—After the discharge of case oil, the vessel, unless she at once goes to sea, shall remain at, or proceed without delay to, one of the anchorages specified in the third of these rules; and shall not remove therefrom until all her holds which have contained case oil shall have been thoroughly cleansed and ventilated by the removal of all oil and vapour, unless the special permission of the Harbour Master has been obtained, except for the purpose of proceeding to sea, or through stress of weather.

**CLIMATE.**—Hong Kong is subject to an excessively hot and a somewhat cool season, coinciding with the south-west and north-east monsoons; it has also a dry and rainy season. The average annual range of temperature is from 55° to 86°. The mean maximum monthly temperature in 1909 was 87·5° in August, and the mean minimum 57°, in February. See Meteorological table in the Appendix for a long period, page 567.

The climate for five months in the year is very good, though the temperature is rather subject to sudden fluctuations. The summer months are trying to Europeans, owing to the damp heat.

July and August are the hottest months, the temperature ranging from 72° to 97°, with a difference of 10° or more between day and night. The city, being situated on the northern side of the island under the peak, is completely sheltered from the south-west monsoon, which, on the southern side of the island, agreeably tempers the violent heat.

November to January is the coolest period, and the air is often bracing; the temperature occasionally falls to about 40°, and ice has been known on the peak, but this is rare; sudden changes frequently take place, a day of almost tropical heat being followed by a cutting northerly wind, for when calms and variables prevail it is hot even in winter, but the north-east wind and overcast sky reduces the temperature; north-easterly gales are common in autumn and spring, and last two or three days.

*General charts 1466, 1180, &c.*

*Charts 1459, Hong Kong harbour; also 3729, 3280. Var. nil.*

In January, 1893, ice formed both at Hong Kong and Kau lung at sea level. The lowest mean temperature registered at the Observatory was on the 17th, air  $36\cdot2^{\circ}$ , wet bulb  $30\cdot9^{\circ}$ . On the Chu kiang, about 28 miles below Canton,  $23^{\circ}$  was recorded.

March and April are rainy and foggy, and the damp is so penetrating that the greatest care is required to prevent clothes, books, instruments, stores, &c., from being destroyed or injured by mildew.

The wet season commences in May and continues until the beginning of August, and during this period the rain falls almost without intermission, frequently causing floods which do great damage.

The minimum annual rainfall from 1853 to 1891 was  $59\cdot72$  inches in 1860, and the maximum  $120\cdot66$  inches in 1883, the annual mean being  $90\cdot17$  inches. The total rainfall in 1910 was  $70\cdot12$  inches. The average during the 10 years preceding 1910 was  $81\cdot10$ . See Meteorological table in the Appendix, page 567.

**Diseases.**—Although visited by sickness caused by malaria, for salubrity, Hong Kong compares favourably with most of the ports of the East, and its healthiness has been greatly increased of late years by sanitary arrangements and excellent water supply.

The most unhealthy years have been those most deficient in rainfall. Dysentery and intermittent fever are not uncommon, and the bilious remittent fever, sometimes nearly allied to yellow fever, occurs in the summer season; small-pox prevails from November to March.

The chief causes of death in 1901 among the non-Chinese resident civil community were plague, phthisis, malaria, and pneumonia. In that year there were more cases of small-pox than usual, and some cholera cases were imported.

The plague first made its appearance in the island in 1894, it recurred in 1898; in 1899 the number of deaths from this disease was 1,428; in 1,900, 1,034; and in 1901, 1,562.

Beri beri is common amongst the Chinese, but the disease is not, as it now exists, very infectious, and does not become epidemic.

Neglect of the usual conditions of health, such as exercise, diet, proper clothing, and the like, conduce to, and exposure to the rays of the sun, even in winter, almost invariably results in sickness.

**HONG KONG ISLAND.**—**Southern coast.**—The bays between Tai long head, the south-east extreme of the island, and the western point of Hong Kong island are, with two exceptions, available for anchorage during the north-east monsoon, but they are not recommended during the south-west monsoon in consequence of the swell, which makes landing difficult for boats. The bays are generally easy of access, with ample depths and good holding ground.

*Plan 380, Taitam bay, and chart 1466.*

**TAITAM BAY**, the easternmost of the bays, lies between the peninsula of which Tai long head or Cape d'Aguiar forms the south extreme, and Taitam head to the westward. It is  $2\frac{1}{2}$  miles in length,  $1\frac{1}{4}$  miles wide at the entrance, clear, and with depths of 8 to 9 fathoms in the entrance, decreasing gradually to 4 and 3 fathoms near its head. Taitam head, the western entrance point, is a high bluff, fairly steep-to. Anchorage and shelter in bad weather during the north-east monsoon can be obtained in Taitam bay, in any required depth.

Water may be obtained at Taitam village (*Lat.*  $22^{\circ} 13' N.$ , *Long.*  $114^{\circ} 13' E.$ ) on the western shore of the bay.

**Beacons.**—Two obelisks, each 30 feet high, have been erected towards the head of Taitam bay and in line  $357^{\circ}$  true lead 3 cables westward of Castle rock, mentioned below.

**Lo chau**, or Beaufort island, lying about a mile off the entrance to Taitam bay, and the north-westernmost of the Pu toi group (page 495), is 878 feet high, flattened at the top, and steep around; its north-western brow has a small peak, with a few large and remarkable boulders on it. It is uninhabited.

**Lo chau pak pai, or Castle rock**, 50 feet high, and with 7 to 10 fathoms around, lies nearly half a mile south-westward of Lo chau, with a rock which dries 2 feet at half a cable west of its north extreme.

**Oliver shoals**, the northern end of which lies  $7\frac{1}{2}$  cables southward of Taitam head, extend  $2\frac{1}{2}$  cables south-south-westward; the least depth obtained on them is 6 fathoms, over coral.

**Directions.**—To enter Taitam bay from the eastward pass through Shing shi mun, the channel between Hong Kong island on the north and Wag lan and Beaufort islands on the south. From the southward pass through Lema channel, and when approaching Lo chau, steer with the beacons in Taitam bay,  $357^{\circ}$  true, which leads westward of Castle rock and eastward of Oliver shoals. Thence as requisite for the anchorage in 6 fathoms off Taitam village, which position is well sheltered from all except southerly winds, and the islands and rocks contiguous to the entrance prevent much swell entering from this direction. In the upper part of the bay caution is required to avoid the numerous fishing stakes.

Stanley, or Chik chui village, lies south-west of Taitam village.

**Tides and tidal streams.**—It is high water, full and change, at Taitam, at 9h. 10m.; springs rise 8 feet; neaps 6 feet. There is very little tidal stream in Taitam bay. The ebb stream sets eastward in Shing shi mun, but the streams are greatly influenced by the wind.

*General charts 1180, 3026, 1962, 3606.*

*Chart 3429, East Lamma channel; also 1466, Hong Kong. Var. nil.*

**COAST.**—**Chik chui wan**, known to Europeans as Stanley bay, is immediately westward of Taitam peninsula. The chart is a sufficient guide for anchoring. On the narrow neck at the head of the bay, separating it from Taitam bay, is the village of Chik chui or Stanley, mentioned with Taitam bay, where the only conspicuous building is the police station, which is connected by telephone with Victoria. The head of the bay is foul to the distance of a cable.

On the higher part of the neck are the ruins of the barracks. The site was found to be very unhealthy, and was discarded; the cemetery is visible from the anchorage.

**Storm signals** are shown here, *see* pages 510-512.

**Chung am wan.**—A barren rocky promontory, rising to a height of 450 feet, and on the summit of which is a remarkable boulder, separates Chik chui wan from Chung am wan. The point of the promontory is known locally as Chung am kok, and is free from off-lying rocks. Chung am wan is of no importance.

**Nganchau** (*Lat. 22° 13' N., Long. 114° 11' E.*) is situated about three-quarters of a mile off the two points of Chung am wan, and the channel between can be used with care. This island is circular in form and 232 feet in height; a few patches of land on its northern side are cultivated. Its coast is fringed with boulders, several sunken rocks lie off it, and it should be approached by large boats with caution.

**Rocks.**—The outer rocks off Nganchau are, on the western side:—Nganchau am pai, a sunken rock with  $2\frac{1}{2}$  fathoms water, situated  $287^\circ$  true  $2\frac{1}{2}$  cables from the summit of the island and  $1\frac{1}{2}$  cables off-shore; on the eastern side is Nganchau tan pai, with 2 feet water, lying 40 yards off-shore just southward of the eastern point, and there are several scattered boulders in this locality; also Tsui lan am pai, a rock with  $2\frac{1}{2}$  fathoms situated 70 yards off the southern point.

**Tsin shui wan** is the bay westward of Chung am wan, and off the point separating them are two steep rocky islets connected by a ridge of sand that covers and uncovers. The highest islet is 92 feet above high water, and is known locally as Makong. Between the islets and the point there is a safe but narrow boat passage, with a depth of  $4\frac{1}{2}$  feet. Makong mi pai, a sunken rock, with 3 fathoms water, lies 65 yards from the western point of Makong.

Tsin shui wan is clear of shoals, but there is generally a swell on, and landing is attended with inconvenience. There is a long sandy beach at the head of the bay, where boats may usefully practice landing and embarking through surf, and the bay can be recommended for running torpedoes, boat firing, &c.

**Sam shui wan**, or Deep water bay, the next bay westward of Tsin shui wan, is easy of access, and the chart is a sufficient guide. The

*General chart 1180, 3026, 1962, 3605.*

*Chart 3429, East Lamma channel; also 1466, Hong Kong. Var. nil.*  
anchorage is good and well sheltered, but it is unavailable for shipping, as several telegraph cables, which are not laid on any defined line, are landed at the beach at the head of the bay, where is the cable hut and also the pavilion of the Royal Hong Kong Golf Club.

On the western side of the bay the chimneys of a tile manufactory are conspicuous, as well as several houses belonging to the establishment on the slopes above the works.

There are no shoals in the bay.

**Tung bo chau** is 389 feet high, and forms a good shelter to Sam shui wan. A rock, which dries 7 feet, lies 40 yards off the western end of Tung bo chau, and Tung bo pai, a rock with  $1\frac{1}{2}$  fathoms of water, lies 50 yards off the southern point of the island.

The channel between Tung bo chau and Hong Kong island is 80 yards across, and there is a depth of only 3 feet in the fairway.

**Sam shui kok.**—A high peninsula with steep cliffy coasts, of which the southern point is Sam shui kok, separates Sam shui wan from Thint shui wan, the next indentation to the westward. A rocky patch lies just westward of Sam shui kok, and extends for 60 yards off-shore, with a least depth of  $1\frac{1}{2}$  fathoms water.

**Thint shui wan** is the eastern end of the passage between Aplichau and Hong Kong island; Deep pass, at its head, about 150 yards wide, connects it with Aberdeen harbour.

The shores of Thint shui wan are foul, and it is not recommended for vessels. About 2 cables southward of Deep pass the channel is much contracted by the flats extending from both sides, with a patch of  $2\frac{3}{4}$  fathoms in the fairway between. On the eastern shore there are several small bays and many scattered rocks.

The northern small bay might be useful as a temporary anchorage for a small vessel, but great caution is necessary in using any of the indentations in Thint shui wan.

*Plan 3385, Aberdeen harbour; also chart 3429.*

**Aplichau (Aberdeen)** island is about one mile in length, north-west and south-east, and 639 feet high; its steep hills are barren of cultivation, but planted with trees on their northern slopes.

A village of some size is situated on its northern side fronting Shek pai, or Aberdeen.

Aplichai is a tongue of land at the south-eastern end of Aplichau; it is about 200 feet in height, with a cliffy coast, and nearly isolated.

Immediately southward of the western point of Aplichau is a cove in which boats or destroyers can obtain sheltered anchorage.

Appli pai, or Assistance rock, lies about a cable  $247^{\circ}$  true of the south extreme of Aplichai. The south-west extreme of Hong Kong island

*General charts 1180, 3026, 1962, 3606.*

*Plan 3385, Aberdeen harbour; also chart 3429. Var. nil.*

touching or shut in by the eastern extreme of Magazine island leads south-westward of it, and if this mark cannot be seen owing to the weather do not bring the eastern end of Magazine island westward of  $315^{\circ}$  true.

**Magazine island** (Fo yo kok chau chai) is separated from the west extreme of Aplichau by a channel  $1\frac{1}{2}$  cables in width. The island is 2 cables long, narrow, 79 feet high, and fringed by shallow water to about 40 yards; a rock, 4 feet high, lies close to its eastern extreme. On its highest part is a conspicuous building with an arched roof, which is a magazine for storing dynamite, and one or two small buildings adjoin it.

A small jetty, alongside which a lighter or small steam boat can lie, is situated in the middle of the northern side of the island.

**West reef** (Lung shan pai) is a rocky cluster about 10 feet high, with a beacon on it, situated  $197^{\circ}$  true,  $1\frac{3}{4}$  cables from the north-western point of Aplichau. There are deep passages between this reef and both Aplichau and Magazine island, which can be used if desired, but the tidal streams are strong and caution is necessary.

**ABERDEEN HARBOUR**, or **Shek pai wan**, lies between the north coast of Aplichau and Hong Kong island; it is safe and well sheltered. The harbour is so narrow that vessels over 200 feet long cannot lie at anchor without blocking the fairway. Owing to the docks at Aberdeen it is frequently visited by vessels of considerable size, but they either go directly into dock or secure between two mooring buoys off the dockyard.

**Docks.**—See Docks in Appendix II., page 560.

**Anchorage.**—A short vessel can anchor on the northern side of the harbour in 5 fathoms at low water, with the north-western point of Aplichau (Fo yo kok) bearing  $213^{\circ}$  true; the dockyard manager's house  $84^{\circ}$  true; and a conspicuous clump of bamboos in the Chinese cemetery on the northern side of the entrance  $286^{\circ}$  true; this clump of bamboos is useful when anchoring at night. A long vessel can anchor in the middle, in about 5 fathoms, with Fo yo kok bearing  $160^{\circ}$  true, distant  $1\frac{1}{2}$  cables.

**Storm signals** are shown here, see pages 510-512.

**Fishing vessels** resort to Aberdeen in great numbers and the harbour is generally crowded with them.

**Rocks.**—There are a few scattered rocks off the north-western entrance point of the harbour, which must be guarded against by boats. Pollux rock, the outer one, dries at low water springs. The eastern end of Magazine island in line with the western or middle point of Aplichau leads outside these rocks.

*General charts 1180, 3026, 1962, 3605.*

*Plan 3385, and chart 3429. Var. nil.*

**Tidal streams.**—It is high water, full and change, at Aberdeen, at practically the same time as at Hong Kong harbour. The flood stream sets westward through Deep pass, and attains a rate of 2 to 3 knots at springs; the stream in the pass turns at about high and low water. In the western part of the harbour there is very little stream. The flood stream sets westward across the channel between Magazine island and Aplichau.

**Directions.**—By the western entrance keep in mid-channel. If using the passage between Magazine island and Aplichau, take care, when the flood stream is running, to avoid being set on the eastern point of Magazine island. The eastern approach, through Thint shui wan and Deep pass, is not recommended for any vessel larger than a destroyer; Deep pass is only about 150 yards across, and the course through is not straight, which makes the pass difficult for larger vessels except at slack water. It is generally crowded with fishing craft. There is plenty of water in the pass, and the following directions are given should it be necessary to use it.

Proceeding up Thint shui wan, as Deep pass is approached, bear over to the eastward until the left extreme of the point under the police station at Shek pai bears 300° true, when the high chimney of the dockyard will be in line with it. Steer towards the point, edging gradually northward as Deep pass point is neared till it bears 296° true, and pass through the narrows with the point on this bearing.

A hard spit extends from the northern side of the eastern of the two islets on the southern side of the passage for 70 yards from high water mark to the one-fathom contour. To clear this spit keep Deep pass point bearing 97° true, astern, and when the islet is abeam steer through the middle of the harbour.

In using Deep pass ease the engines as much as possible to prevent damage being done to boats by the wash from the propellers.

*Chart 3429, East Lamma channel.*

**The western bays** on the south-western coast of Hong Kong island westward of Aberdeen harbour are: Waterfall bay, a mere bend in the coast, of no importance; Taiho wan or Pokfolum bay, which might be useful if telegraph cables were not landed in it; and Sandy bay, which is clear; a patch of 3 fathoms lies southward of it, at 2 cables 202° true of the point southward of Hoi chi village. These bays are not recommended, and Taiho wan should especially be avoided, as the cables are not laid on any defined line.

**EAST LAMMA CHANNEL** lies between Lamma island, page 483, and Aplichau or Aberdeen island and Magazine island off the

*General charts 1180, 3026, 1962, &c.*

*Chart 3429, East Lamma channel. Var. nil.*

south coast of Hong Kong, above described. Its least breadth is about 9 cables between the north extreme of Lamma and Magazine island, and the fairway depths are from 12 to 20 fathoms, soft mud bottom.

**Lamma patch**, with  $5\frac{1}{2}$  fathoms least water, lies in the fairway of the north-west entrance, the shallow spot lying  $34^\circ$  true about  $4\frac{1}{2}$  cables from Pa kok, the north extreme of Lamma island.

East Lamma channel is the shortest route to the western entrance of Hong Kong harbour from the eastward.

**Measured distance.—Beacons.**—A distance of 5 miles is marked off in East Lamma channel, the running line being marked by a white painted patch on Pu toi in line with the summit of Castle rock  $123^\circ 31'$  true. The depths on the running line range from 12 to 20 fathoms.

The eastern portion, 2 miles, lies between the pair of beacons in line on Bluff point, Taitam peninsula and a pair on Nganchau; the western portion, 3 miles, between the latter beacons in line and the one on the east extreme of Magazine island in line with that on the north side of Aberdeen harbour, as charted.

*Chart 3605, Hong Kong to Mirs bay; also chart 1180.*

**EASTWARD OF HONG KONG. — NINEPIN GROUP** is situated about 3 miles north-eastward of Lamtong island, east side of Tathong channel, the eastern entrance to Hong Kong harbour.

**North and South Ninepin**, the two largest islets, lie north and south of each other, separated by a channel 2 cables wide. The southern coast of South Ninepin is a precipitous cliff, 359 feet high, the northern part of the islet is lower; close to its south-western side is a smaller islet, 178 feet high, and there are several small islets or rocks near its north-east coast.

North Ninepin is 337 feet in height, and has a cleft near its northern end. Close off this end are two islets, the nearest being 280 feet high; there is a rock which dries 7 feet close outside the northern islet.

Close off the south-west extreme of North Ninepin is a small islet.

**North rock** (*Lat.  $22^\circ 16\frac{1}{2}'$  N., Long.  $114^\circ 21\frac{1}{2}'$  E.*), about 12 feet high, lies half a mile north-eastward from North Ninepin group; a reef which dries 6 feet lies half a cable south-eastward of it, and a rock with  $4\frac{1}{2}$  fathoms lies nearly one cable  $0^\circ$  true, with a spit of 8 fathoms extending north-west of it.

**East Ninepin**, shaped like a sugarloaf when seen from the north-westward and south-eastward, is 208 feet high; it is much smaller than North or South Ninepin, being one cable long north-west and south-

*General charts 3026, 1962, 2661a and b, 1262.*



*Chart 3605, Hong Kong to Mirs bay; also 1180. Var. nil.*

east, and little more than half a cable broad. A smaller islet, 93 feet high, lies one cable off its north-western end, and a rock 19 feet high is situated one cable from its western side.

**One-foot rock**,  $186^{\circ}$  true, distant 7 cables from East Ninepin, has only one foot water; Fo tau point in line with the southern point of South Ninepin,  $278^{\circ}$  true, leads southward of it.

**Victor rock**, about 40 feet in extent, with a depth of 3 fathoms,  $5\frac{1}{2}$  to 6 fathoms close-to, and 14 fathoms around, lies in the track of vessels proceeding along the coast,  $59^{\circ}$  true, distant  $4\frac{1}{10}$  miles from East Ninepin, and  $3\frac{3}{8}$  miles from the summit of Basalt island, nearly abreast it.

**CLEARING MARKS.**—The summit of Lam tong island in line with the north extreme of North Ninepin group bearing  $245^{\circ}$  true leads half a mile north-westward; and the summit of South Ninepin open of the south-east extreme of East Ninepin bearing  $242^{\circ}$  true leads about a quarter of a mile south-eastward of Victor rock.

**Caution.**—The depths in the vicinity of the Ninepin group give no indication of approach to them, and caution must be exercised in thick weather.

**Tides.**—It is high water, full and change, at the Ninepin group at 10h. 0m.; springs rise 5 feet.

**COAST.—Aspect.**—The mainland from Fo tau point (the south extreme of the peninsula forming the east side of entrance to Hong Kong), northward to Port Shelter, is high, a ridge of hills traversing its whole length, and culminating in Tai u kong, 1,130 feet high, a remarkable peak when seen from the south-eastward, with several other peaks of 800 to 900 feet. Hunchback hills, 2,284 feet high, lie within Inner Port Shelter. There are numerous villages and patches of cultivation on the hill sides in the intermediate bays.

**Yi bluff**, 434 feet high, is a prominent bluff with a bight on either side, at about three-quarters of a mile north-east of Fo tau point.

**Steep island**, 330 feet high, is situated half a mile north-eastward from Yi bluff, and 6 cables off-shore.

**A bay** is situated north-westward of Steep island, about three-quarters of a mile in length and a half a mile in width, with depths of 6 to 9 fathoms, open to easterly winds and swell.

A rock, with a depth of 6 fathoms, lies in the approach to this bay at 6 cables north-westward of Steep island; and a rock, with  $1\frac{1}{2}$  fathoms water, lies  $1\frac{1}{2}$  cables off the west shore of that island.

*General charts 3026, 1962, 2661a and b.*

\* *Plan 3612, Port Shelter and Rocky harbour; also chart 3605. Var. nil.*

**Trio islets** are three in number. The eastern and largest is 136 feet high, and the next in size, 84 feet in height, lies half a cable south-westward from it; these two islets are almost connected by a reef and rocks 8 feet high. At 2 cables north-westward of them is the northernmost islet of the group, which is 28 feet high, with a rock 4 feet high close to its eastern side.

**Alexander rock**, with 3 fathoms at low water springs, lies 3 cables  $53^{\circ}$  true from the summit of the largest Trio islet.

**Table islet**, 97 feet high, lies two-thirds of a mile northward of the Trio group.

There are many detached rocks and reefs lying from one-quarter of a cable to 3 cables off the mainland westward of Trio and Table islets, but there is a deep channel between.

**PORT SHELTER.**—About 8 cables northward of Table islet is Jin island (702 feet), with Keui island (707 feet) lying close north of it, being joined together at low water. These two islands divide a deep bay into Port Shelter and Rocky harbour, in either of which good anchorage, mud bottom, may be obtained by vessels of any size. Port Shelter, the western of the two, runs northward 5 miles, and is separated from Tolo channel, Mirs bay, by an isthmus  $1\frac{1}{2}$  miles wide. Its entrance is nearly a mile wide between Jin and Shelter island, and it affords anchorage in 8 to 9 fathoms, and in the inner port in 6 to 7 fathoms.

**Dangers.**—**Peaked rock** (*Lat.  $22^{\circ} 14\frac{1}{2}'$  N., Long.  $114^{\circ} 19\frac{1}{2}'$  E.*) at  $1\frac{1}{2}$  cables southward of Jin island, is a double rock, 44 feet high. A rock, which dries 6 feet, is situated 2 cables  $67^{\circ}$  true from it, and 2 cables  $101^{\circ}$  true from it is situated Ma chai pai, a rock with  $3\frac{1}{2}$  fathoms water.

The space between Peaked rock and Jin island is obstructed by foul ground and rocks, drying 3 feet at low water springs.

Ngong wan pai, a  $5\frac{3}{4}$ -fathoms rocky patch, lies off the south-western part of Jin island at a distance of 3 cables.

**Shelter island**, on the western side of the entrance, is 416 feet high; shoal water extends nearly 2 cables northward of the island, and to a distance of  $1\frac{1}{2}$  cables from its western side.

Ho pai, a 3-fathoms patch, lies 2 cables westward of the western point, and a shoal, with a least depth of  $3\frac{3}{4}$  fathoms, lies in mid-channel between the island and the mainland, to the westward.

Nan pai, a rock with  $2\frac{3}{4}$  fathoms water, lies  $2\frac{1}{2}$  cables south-westward of the south-east extreme.

*General charts 3026, 1962, 2661a and b.*

*Plan 3612, Port Shelter and Rocky harbour; also chart 3605. Var. nil.*

Shoal water extends about 2 cables off the mainland westward of Shelter island.

**Yi pai**, a shoal of rock and sand, 3 cables long, north and south, and from one to  $1\frac{1}{2}$  cables broad, lies near the centre of Port Shelter, 6 cables northward of Shelter island, and midway between it and the south end of Sharp island. The depths over it vary from  $1\frac{1}{2}$  fathoms near the southern end, to 5 fathoms.

**Sharp island**,  $1\frac{1}{4}$  miles northward of Shelter island, rises to a sharp summit 447 feet high. Off its western shore, and connected by a bank, which dries from 4 to 6 feet, is Kiau tau islet, 95 feet high, with rocks extending one cable south-westward from it.

**Inner Port Shelter**, on the western side of Sharp island, affords good anchorage in 7 fathoms, mud. Northward of it are numerous small islets, rocks, and shoals, which extend northward to the mainland.

On the north-western side of Inner Port Shelter is the village of Sai kung, situated on the north side of a small inlet or boat harbour. On the south side of the same inlet, and conspicuous from the anchorage, is a police station, with white buildings, which is in telephonic communication with Hong Kong.

**Tide islet**, 84 feet high, lies about 3 cables north-west of Sharp island.

**Hebe haven**, on the north-western side of Port Shelter, is a snug anchorage for small vessels. A rock, with  $2\frac{1}{2}$  fathoms, lies 2 cables south-eastward from the entrance, on Pak ma tsui bank, which extends southward of the eastern point of entrance.

**Channel.—Head of the port.**—There is a passage between Sharp island and Keui island, from one to 3 cables wide; towards its northern end is Yum tin pai, a rock with a depth of  $2\frac{1}{2}$  fathoms, which lies about  $1\frac{1}{2}$  cables from the Sharp island shore. Off the point southward of rock, rocks apparently above water extend  $1\frac{1}{2}$  cables into the channel.

About 3 cables north of the north extreme of Sharp island is Cha yu pai, a rocky patch with a least depth of  $1\frac{3}{4}$  fathoms.

**Anchorage.**—Vessels of moderate draught can proceed through the pass between Sharp and Keui islands, and anchor in 4 fathoms to the northward of Sharp island, or pass northward of Im tin tsz, Keui island, and Urn island, into Rocky harbour, in a depth of not less than 19 feet at low water.

**Directions.**—The channel is narrow in places, and the plan is the best guide.

*General charts 3026, 1962, 2661a and b.*

*Plan 3612, Port Shelter and Rocky harbour; also chart 3605. Var. nil.*

There is no channel, except for boats, between Inner Port Shelter and the anchorage north of Sharp island.

**Mission.**—A Roman Catholic mission,\* with a conspicuous church, is established on Im tin tsz.

**Tides.**—It is high water, full and change, in Port Shelter and Rocky harbour at 8h. 50m. (approximately); springs rise 7 to 9 feet, neaps rise 5 to 6 feet, but the tides are subject to a large diurnal inequality.

**ROCKY HARBOUR** is between Keui and Jin islands on the west, and High, Town, and Bluff islands on the east and south-east.

The entrance of the harbour between Bluff and Jin islands is one mile wide, with depths of 8 to 9 fathoms.

**Islets.—Dangers.**—**Bay islet**, lying 2 cables eastward of Jin island, is 147 feet high; midway between Bay islet and the northern end of Bluff island is Ngai kap pai, a rocky patch with a depth of 3 feet, and a shoal of 3 fathoms at  $1\frac{1}{2}$  cables eastward of it, eastward of which the depths vary from  $3\frac{1}{4}$  to  $4\frac{3}{4}$  fathoms, over rocks and sand.

Pyramid rock, 123 feet high, open northward of Bluff island leads north-eastward of Ngai kap pai and the 3-foot patch.

**Green islet**, 50 feet high, is situated on the eastern shore half a cable westward of the southern portion of High island. Wok tuk pai, a rocky patch with a least depth of  $2\frac{3}{4}$  fathoms, lies about  $2\frac{1}{2}$  cables westward of the islet.

**Anchorage.**—There is anchorage in the north-east monsoon on the eastern side of the harbour at the entrance to the cove northward of Green islet, where there is a mandarin station and a village, but the space is confined, owing to sunken rocks. In the south-west monsoon there is better shelter northward of Bay islet.

**Basalt island** is 8 cables long, north and south, and 569 feet high; Bluff island, about the same size, and 504 feet high, lies 4 cables westward of it; and the south extreme is named Collinson head; the southern coasts of both islands are precipitous, the summit of Steepcliff head, the southern extreme of Basalt, being 307 feet high.

The depths in mid-channel between these two islands range from  $5\frac{1}{2}$  to 10 fathoms, with the exception of a rocky patch of  $4\frac{3}{4}$  fathoms situated about 2 cables  $112^\circ$  true from the northern end of Bluff island.

**Town island**, 232 feet high, lies a quarter of a mile north-eastward of Bluff island, and at  $1\frac{1}{2}$  cables eastward of Town island is Hole island. Pyramid rock, 123 feet high, lies off the north side of Basalt island.

*General charts 3026, 1962, 2661a and b.*

*Plan 3612, Port Shelter and Rocky harbour; also chart 3605. Var. nil.*

**The channel** between Town and Basalt islands is narrowed to less than a cable by Wei sam chau islets, and Wave rock, which dries 7 feet, and is situated at  $1\frac{1}{2}$  cables from the southern shore of Town island; the tidal streams in this channel form chow chow water, or whirling eddies.

**The channel** between Town and High islands is very narrow, and has a least depth of 19 feet. It is much used by local steam launches plying between Hong Kong and Mirs bay.

**Hole island** (Lat.  $22^{\circ} 20' N.$ , Long.  $114^{\circ} 22\frac{1}{2}' E.$ ), 309 feet high, is precipitous and bare; Wan chau kok, its eastern extreme is perforated, and the northern end is much broken up.

The channel between Hole and Town islands is not navigable.

**Hwang ngai chau** is a small islet, 71 feet high, situated about a third of a mile north of Town island.

**Kwang tai pai** is a small islet, 60 feet high, situated a third of a mile northward of Hole island; a rock which uncovers 2 feet lies one cable south-eastward of its south point.

**High island** has a length of  $2\frac{1}{2}$  miles, and at its northern end is of about the same breadth; it has a well-defined summit, 905 feet high.

Broken head, the east point, is cliffy, and 155 feet high, appearing as a separate island when seen from the southward.

Between the north side of High island and the main is a channel which dries from one to 3 feet in some places.

*Chart 3605, Hong Kong to Mirs bay.*

**Conic islet**, 165 feet high, lies close off a point of the mainland, and 6 cables east-north-eastward of the eastern point of High island; immediately westward of it is a bay  $3\frac{1}{2}$  cables wide and three-quarters of a mile deep, with depths of 4 to 8 fathoms, sandy bottom. There is a village at the head and a sandy beach, but landing is often difficult owing to the swell.

**Ping point** lies three-quarters of a mile northward of Conic islet. Ping hill, over it, is 753 feet high and conspicuous from the south-eastward.

**Boole rock**, with a depth of 4 fathoms, lies  $1\frac{1}{2}$  cables north-eastward of Ping point, and about the same distance from the shore.

**Fung bay** is  $1\frac{1}{2}$  miles wide between Ping hill and Fung head; it has depths of 7 and 8 fathoms, is open to the eastward, and has the three Chim chau, islets 158, 132, and 31 feet in height, respectively, in its centre, with a patch which dries 6 feet westward of the northern and smallest islet.

*General charts 3026, 1962, 2661a and b.*

*Chart 3605, Hong Kong to Mirs bay. Var. nil.*

Fung bay, within the head, is foul to about  $1\frac{1}{2}$  cables off-shore.

A heavy swell sets into this bay, except during the summer months; Sai wan village is situated on the south-western side, and Tai long village on the western shore.

Landing can be effected at Sai wan.

**Fung head** is a rocky point about 300 feet high and steep-to, with an islet 45 feet high close to it, outside of which is a rock 5 feet high.

**Aspect.**—In the vicinity of Fung bay the mountains known as Tai yu shan (Whale), 1,030 feet high, and Tai mun shan, 1,201 feet high, are conspicuous.

*Chart 3474, Mirs bay; also 3605.*

**MIRS BAY.**—Mirs point is situated east-north-eastward  $5\frac{1}{2}$  miles from Fung head, and between is the entrance to Mirs bay, which extends thence north-westward about 12 miles; Tolo channel and harbour extend south-westward about 12 miles from Middle island on the south-western side of the bay.

Vessels can lie securely in Mirs bay during a typhoon, there being many well-sheltered anchorages available for all classes. Long harbour is considered the best; Tolo harbour is also good, and fairly good shelter may be obtained under Pengchau when the wind is southerly.

**Aspect.**—The land in the vicinity of Mirs bay is high. Ma on shan or Hunchback hills, 2,284 feet high, before mentioned, at 9 miles westward of Fung head, and Sharp peak, 1,525 feet high, at 2 miles within Fung head are conspicuous. Chong hill, 3,095 feet high, and North cone, 2,472 feet high, both on the north-western side of this bay, also are conspicuous summits.

**Islands and dangers.**—**Shek ngau chau (Gau tau)**, a rocky islet, 86 feet high, lies in the fairway within the entrance and  $22^\circ$  true  $3\frac{1}{2}$  miles from Fung head.

**Breaker reef**, a rocky ledge 3 cables long, north-west and south-east, lies half a mile south-westward of Shek ngau chau. The central part of the reef dries 5 feet, and generally breaks.

**Wong man chau (South Gau)**, an islet 60 feet high, surrounded by foul ground, is about half a mile off the point within Bate head, which is situated  $1\frac{1}{2}$  miles northward of Fung head.

**Bate head** has two rocks, 69 and 37 feet high, near it, with deep water fairly close to them. The shore of the bay westward of Bate head is foul to the distance of 2 to 3 cables westward of the point, which has two islets close off it, as charted.

*General charts 3026, 1962, 2661a and b.*

*Chart 3386, Long harbour and approaches; also 3474. Var. nil.*

There is a patch of  $2\frac{1}{4}$  fathoms on the north-west side of the bay  $1\frac{1}{2}$  cables off-shore under the 413-foot hill. There is anchorage near the head of the bay, off Nam tsin village, in about 8 fathoms, during southerly winds, or closer in according to draught.

**South channel**, leading into Long harbour, is barely half a cable wide, with a depth of  $3\frac{1}{4}$  fathoms in its navigable part; shoals extend from both shores, and there is a rock which dries one foot at nearly a cable from the north shore.

**Grass island** (*Lat.  $22^{\circ} 30' N.$ , Long.  $114^{\circ} 21\frac{1}{2}' E.$* ) is  $1\frac{1}{4}$  miles in length north and south, 6 cables wide, and 401 feet high.

**Kong chau**,  $3\frac{1}{2}$  cables eastward of Grass island, is a steep black islet, 111 feet high; the passage between is blocked by a ridge of sunken rocks, some of which dry at low water and is not navigable.

**Waterwitch rock**, with a depth of  $1\frac{3}{4}$  fathoms, lies with the eastern extreme of Kong chau bearing  $309^{\circ}$  true, distant 3 cables; it is steep-to on its eastern side. Bate head open eastward of Wong mau chau leads eastward of Waterwitch rock, and Bluff head in line with the south extreme of Port island,  $304^{\circ}$  true, leads 2 cables north-east of that rock and close northward of Channel rock.

Fishing stakes and nets close together extend from the south end of Grass island to Shek ngau chau, or half-way across Mirs bay.

**Port island**, 422 feet high, is separated from Grass island by Middle channel, 6 cables wide; a narrow rocky ledge, with pinnacles on it, projects one cable north-eastward from the island. There is a convenient watering-place on its northern side.

**Middle channel** has a fairway depth of 11 to 13 fathoms, with Channel rock its only danger.

**Sam pai (Channel rock)**, awash at high water, and generally breaking, lies on the south side of Middle channel, 3 cables north-eastward of the northern part of Grass island.

The leading mark through Middle channel, between Channel rock and Port island, is the north summit of Harbour island in line with a large boulder on Gruff head, bearing  $251^{\circ}$  true.

**LONG HARBOUR**, the entrance to which is situated between Grass island and Titau peninsula, extends southward for  $2\frac{1}{2}$  miles, with a breadth of from 6 cables to one mile, to Stokes point, which is foul to the distance of a cable; here it divides into two narrow arms, named East and West arms, the heads of which are shallow for about a quarter of a mile.

The harbour affords good anchorage in 5 to 8 fathoms, mud bottom.

*General charts 3605, 3026, 1962, 2661a and b.*

*Chart 3386, Long harbour and approaches; also 3474, Mirs bay.*

White cove lies in its north-west corner, south of Titau peninsula; it has depths of 5 to 6 fathoms, with a patch of  $2\frac{1}{2}$  fathoms at about a cable off the western shore.

**Dangers in the approach.**—Le Mottée shoal, with a depth of 2 fathoms, extends  $1\frac{3}{4}$  cables from the western shore of Grass island; its western extremity is steep-to, and lies with the western extremity of Grass island bearing  $357^\circ$  true, distant just over 2 cables.

Junk rock, with a depth of 4 feet, lies with the western extreme of Grass island bearing  $346^\circ$  true, distant  $6\frac{1}{2}$  cables.

**Warburg rock**, with  $4\frac{3}{4}$  fathoms in the fairway, with the western extreme of Grass island bearing  $0^\circ$  true, distant 9 cables.

**CLEARING MARK.**—The west extreme of Port island in line with the west extreme of Grass island, bearing  $6^\circ$  true, leads two-thirds of a cable westward of Warburg rock.

**Phillimore rock**, with a depth of  $4\frac{1}{2}$  fathoms, lies  $1\frac{1}{4}$  cables from the western shore of the harbour, and half a mile south-eastward from Ocean point, the north extreme of Titau.

**Anchorage** in Long harbour and Jones cove is reserved exclusively for the use of H.M. ships.

**Supplies.**—Poultry, eggs, and fish may be obtained in limited quantities. Steam launches run every other day between Hong Kong and Mirs bay, calling at Sha u chung, Yim tim, and Tap mun.

**Jones cove**, westward of Long harbour, is about three-quarters of a mile in length and 3 cables in width, with depths of 6 to 7 fathoms, mud bottom; but it, as well as Long harbour during northerly winds, is open to a considerable northerly swell. On the western side of the approach are three islets on the same flat, and  $1\frac{3}{4}$  cables northward of Flat islet, the largest, lies Chu ma pai, 2 feet high, with a rock to the westward on the same flat, which dries 7 feet.

A rock, which dries 3 feet, lies one cable  $247^\circ$  true from Flynn point, east side of the harbour.

**NORTH CHANNEL**, leading into Tolo channel and harbour, between Port island and Bluff head, is nearly  $1\frac{1}{4}$  miles wide, with depths of 9 to 10 fathoms; Tolo channel thence trends about  $236^\circ$  true for 7 miles to White head, and is not less than 7 cables wide, its shores being steep-to, with a depth varying from 6 to 14 fathoms on the northern shore.

**Bluff head** (*Lat.  $22^\circ 30\frac{1}{2}'$  N., Long.  $114^\circ 20'$  E.*) separates North channel from Wangchuk kop hoi; it is the extreme of a peninsula about 2 miles in length, with a ridge of hills from 500 to 900 feet in height running through it. There is a beacon within the bluff, and

*General charts 3605, 3026, 1962, 2661a and b.*



*Charts 3329, Tolo harbour; and 3474. Var. nil.*

near the 661-foot summit about a mile to the westward is another beacon.

**Reefs.**—Within the channel at  $3\frac{3}{4}$  miles from Bluff head, is Knob reef, with rocks on its western part from 4 to 15 feet high, with a rocky ledge extending north-eastward  $1\frac{1}{2}$  cables from them; Flat reef dries from 3 to 6 feet, and lies 3 cables south-westward of Knob reef. Bush reef lies  $1\frac{8}{10}$  miles above Flat reef, and about 4 cables southward of Harbour island. Although there is a navigable channel on either side of these reefs, the northern being the wider is preferable.

There are a number of fishing nets and stakes between Bush reef and the eastern shore, as charted.

**Harbour island**, 345 feet high and 6 miles within Bluff head, terminates the northern side of the western end of Tolo channel; here the inlet separates into four arms, Three-fathoms cove southward, Tide cove south-westward, Tolo harbour westward, and Plover cove north-eastward.

**Sam chung a (Three-fathoms cove)**, the southern arm, about  $1\frac{1}{2}$  miles in length, has depths of  $3\frac{1}{2}$  to 4 fathoms. There are two islands on the western side connected with the shore by shallow flats; the outermost is Sigan, 29 feet high.

**Tide cove**, westward of White head (Tau tau jau), on the southern shore, is  $3\frac{1}{2}$  miles in length, and the water shoals gradually from 5 fathoms to its head.

A rock, which dries 4 feet, lies in the fairway abreast a waterfall, about  $1\frac{3}{4}$  miles south-westward from White head. There is anchorage in Tide cove in 3 to 4 fathoms, protected in all winds.

There is a police station at the head of this cove, from whence there are several paths leading over the hills to Kau lung city, the principal of which are those passing over the Grasscutters, Shatin, and Kau lung passes.

**Railway.**—The Canton-Kau lung railway runs along the western shore of Tide cove.

**Plover cove** trends north-eastward  $2\frac{1}{2}$  miles within Harbour island, and has depths of 4 to 6 fathoms. It affords very good anchorage.

A patch dries one foot near its head, and one which dries 4 feet off the point southward of Wang chuk kok, on the northern shore; and there is a reef with two rocks, 8 and 9 feet high, in the bay westward of this point, in the approach to Wang chung; Yeung chau lies in the circular bight in the western part of Plover cove.

*General charts 3605, 3026, 1962, 2681a and b.*

*Charts 3329, Tolo harbour; and 3474. Var. nil.*

**Settlement.**—**Tolo harbour** lies at the head of Tolo channel, with Centre island, 80 feet high, in its fairway, with depths of  $4\frac{3}{4}$  fathoms on either side, gradually shoaling to the settlement, Tai po, where are situated the Governor's bungalow, the Magistracy, and the Police station. The frontier road, a broad macadamised road, 18 miles in length, leads from Tai po into Yau ma ti, through Lai chi kok pass at the head of Tide cove.

A conspicuous red house stands on a small island 4 cables eastward of the police station; this island is connected with the mainland by a causeway. The cove, situated half a mile eastward of the above island, is crossed by a conspicuous railway bridge, westward of which there is a small pier.

A white beacon marks the rock eastward of the island.

**Railway.**—The Canton-Kau lung railway runs along the head of Tolo harbour.

**Storm signals** are shown here, *see* pages 510-512.

*Plan 3544, Starling inlet, Crooked harbour, and Double haven.*

**ISLANDS.**—**Northward of Bluff head.**—North-westward of Bluff head lie a group of islands, the largest of which are Tung wan to (Double island), Lo kwai wan to (Crescent island), and Crooked island, the northernmost. Song to (Round island), the easternmost of the group, lies 2 miles  $349^\circ$  true from Bluff head.

**Cocks head rock** (*Lat.  $22^\circ 33' N.$ , Long.  $114^\circ 19\frac{1}{2}' E.$* ), with a depth of  $3\frac{3}{4}$  fathoms, lies  $98^\circ$  true,  $3\frac{1}{4}$  cables from Kai kung tau (Peaked head), the easternmost point of Crooked island.

**Wang chuk kok hoi**, the inlet northward of Bluff head, extends west-south-westward for  $1\frac{1}{2}$  miles from its entrance between Bluff head and Mit kok tsui, and has a breadth of 3 to 4 cables; it affords good anchorage in from 6 to 8 fathoms, mud bottom.

Kang mun, a boat channel, leads into Double haven from its western end.

**DOUBLE HAVEN**, over a mile in extent, one of the best anchorages in Mirs bay, is completely landlocked, and has an average depth of 7 fathoms over a mud bottom. There are three entrances;—

**Chut mun**, between Crescent and Double islands, having a least depth of  $3\frac{1}{2}$  fathoms, and one-third of a cable wide at its narrowest part, which is just eastward of Ku lun shek (Unicorn rock), a peaked rock, 22 feet high, jutting out from the shore of Tung wan to.

**Deep pass**, between Lo kwai wan to (Crescent island) on the east, and Tui mui chau and Crooked island on the west, has depths of 11 to 15 fathoms; it is just over one cable wide, and clear of danger.

*General charts 3474, 3605, 3026, 1962.*

*Plan 3544, Starling inlet, Crooked harbour, & Double haven. Var. nil.*

**Tsing chau la**, the north-western entrance, between Sandy point and Table island, is 2 cables wide, with depths of  $6\frac{3}{4}$  fathoms.

Tsing cheuk (Table island), Fung cheuk chau, and several other islands are situated on the west side of the entrance from the northward.

**Dangers.—Village rock**, which dries 6 feet, lies at the extreme of a rocky ledge extending  $2\frac{1}{4}$  cables southward of Crooked island, and  $110^\circ$  true  $3\frac{1}{2}$  cables from Sandy point, which point is foul to the distance of a cable.

**Middle ground**,  $1\frac{1}{2}$  cables long in an east and west direction, and half a cable broad, having near its western end a rock with a depth of 6 feet, lies 7 cables  $152^\circ$  true from Sandy point. Two rocks, drying 7 and 3 feet, respectively, are situated one cable southward of Yuen tsz chek, and  $1\frac{3}{4}$  cables north-westward of Middle ground.

**Fu yung cheuk tau**, a rocky ledge with depths of from 6 to 20 feet, and on which is a rock that dries 4 feet, extends nearly 2 cables south-eastward from Fu yung cheuk.

**Woodman reef**, with 2 feet least water, extends  $1\frac{1}{2}$  cables north-westward from Snake island.

**Horley rock**, with a depth of 5 feet, lies  $3\frac{3}{4}$  cables  $59^\circ$  true from Snake island.

Most of the islands are surrounded by reef, as charted.

**CROOKED HARBOUR**, westward of Crooked island, and north-west of Double haven, with which it is connected by Tsing chau la, is over a mile in length, and affords good anchorage in 6 to 7 fathoms, mud. The eastern shore is free from danger; off the western shore are several islets, of which Ap cheuk (Robinson island), the northernmost, at the entrance, is 86 feet high, and has a reef extending 2 cables north-eastward from it.

**Young Hebe shoal**, with 3 fathoms least water, lies  $8\frac{3}{4}$  cables  $357^\circ$  true from the north point of Crooked island, midway between it and the northern shore of Mirs bay. The bank, with depths of  $4\frac{1}{4}$  fathoms, on which it is situated, extends to within half a mile of the northern shore of Mirs bay, and between its southern end and Chek kok tau, the north point of Crooked island is a channel 5 cables wide, with depths of about 9 fathoms.

**STARLING INLET**, westward of Crooked harbour, extends for 3 miles from Cheung pai tau (Ledge point) in a south-westerly direction, with a breadth of about three-quarters of a mile, the depths gradually decreasing to its head, which is shallow.

*General charts 3474, 3605, 3026, 1962, 2661a and b.*

*Plan 3544, Starling inlet, Crooked harbour, & Double haven. Var. nil.*

There are three patches of 3 fathoms on the north side of the approach, within the 3-fathoms contour line, off Im tin Custom-house, but in the inlet there are no dangers outside the 2-fathoms contour.

**The town** of Sha tau kok, where there is a Chinese Custom-house, stands on its western shore; and a British police station is situated on the northern shore at U shek kok, at the head of the inlet.

The pawnshop tower and Custom-house flagstaff at Sha tau kok, as well as a flagstaff and the police station at the head of the inlet, are conspicuous objects.

*Chart 3474, Mirs bay; also chart 3605. Var. nil.*

**NORTHERN SHORE OF MIRS BAY.**—Eastward of Im tin town is a prominent point, steep-to; in the bight eastward of it is Peak rock, 63 feet high, surrounded by sunken rocks, some of which dry at low water. Thence eastward the shore and also the bay are free from dangers, with depths of 7 to 9 fathoms.

Sha ne chung, with a Custom-house, lies in the north-east corner, whence the coast turns south-eastward to Albion point, off which is Peng chau.

**PENG CHAU** (*Lat. 22° 32½' N., Long. 114° 25½' E.*), from 100 to 138 feet in height, is a crescent-shaped island, about a mile in length; its north-western and south sides are cliffy, and fringed by reef to the distance of a cable, and its eastern side is shallow to a distance of nearly 2 cables. A rock awash at low water lies a cable north of its eastern extreme. A patch of 4 fathoms lies about a quarter of a mile southward of its south extreme.

The geological formation of the island is different from that of the adjacent land, being alluvial, and its beaches are of shale stones.

**Aspect.**—**East cone**, a remarkable peak, 745 feet high, lies east-north-eastward of Peng chau, and on the northern part of the isthmus dividing Mirs from Taipung bay; this isthmus is 1¼ miles across, and low.

**Peng chau road.**—There is good anchorage in 7 fathoms during the north-east monsoon between it and the mainland north-eastward, but it is much obstructed by fishing stakes.

**Islets.**—There is a peaked rock or islet, 40 feet high, with sunken rocks around it near the shore, west-north-west of East Cone; and there is one 50 feet high at 6 cables westward of the Custom-house in the bay 1¼ miles southward of East Cone, the water being all shallow within it.

**A shoal**, with a least depth of 4½ fathoms, lies 4½ cables westward of the 50-feet islet, with depths 5½ to 8 fathoms around.

*General charts 3605, 3026, 1962.*

*Chart 3474, Mirs bay; also chart 3605.*

**Mirs point.**—The coast from the islet trends southward to Mirs point,  $5\frac{1}{2}$  miles distant, close off which is Griffin rock, 50 feet high. There are no off-lying dangers between. The land within the point rises to the height of 1,284 feet; at about a mile eastward of the rock and 2 cables off-shore, are some rocks, the point within which is perforated.

There is a boundary beacon near the point.

**Caution** is required to avoid the numerous fishing platforms on stakes in 6 to 9 fathoms, especially at night.

**Tides and tidal streams.**—In Tide cove, south-west corner of Mirs bay, it is high water, full and change, at 9h. 20m. (approx.); springs rise 8 feet; at neaps the water remains nearly at the same level. A double high tide is experienced at times in the north-western part of Mirs bay. The first high water occurs three to four hours before the second high water, with a fall of about one foot in the interval.

There is a strong indraught into Mirs bay and Rocky harbour during the flood stream; in the bay the streams are almost inappreciable.

**Directions.**—No special directions are necessary for entering the various anchorages in Mirs bay; the dangers with clearing marks have been described with the approaches and anchorages in the order in which they occur.

**Offing streams.**—The ebb stream runs southward along the western shore of the approach to Mirs bay, and a sailing vessel working to windward against a south-westerly wind should keep near the land passing between Ninepin group and Lamtong; but there is a very strong set eastward from Lema channel when it opens.

During August and part of September from the eastward of Lema islands it is difficult to work along shore westward; therefore, either stand off to the southward, or anchor temporarily in Mirs bay, easterly winds being usually frequent in these months near the coast.

*Chart 3026, Macao to Pedro Blanco. Var. nil.*

**COAST.—Aspect.**—The coast of the peninsula separating Mirs and Bias bays trends east-north-eastward 8 miles from Mirs point to Teyi point; Coast islet, about  $2\frac{1}{4}$  miles eastward of Mirs point, lies 3 cables off the western point of a sandy bay. There is another sandy bay nearly 3 miles eastward of Coast islet; White rock, which is remarkable, lies half a mile eastward of the eastern entrance point of this bay. The peninsula is mountainous, and reaches in Chiyung shan a height of 2,810 feet, with a peak of 2,630 feet in height between it and Teyi point. At 6 miles eastward of Mirs point, and separated from the peninsula by a channel about  $1\frac{1}{2}$  miles in width, is the Tuni ang group.

*General charts 3026, 1962, 2661b.*

*Plan of Samun road on 3002, and that chart. Var. nil.*

**TUNI ANG** (Lat.  $22^{\circ} 28' N.$ , Long.  $114^{\circ} 38' E.$ ), the northern island, is about 2 miles in length, east and west, one mile in breadth, and its southern part rises in a cone to the height of 960 feet; islets and rocks, with foul ground around, extend about 9 cables westward of the north-western point of the island; Net islet, the nearest, is sugar-loaf shaped; Peak rock, 80 feet high, lying a quarter of a mile westward of Net islet, appears like two islets (shown as two in the plan) with a shingle beach connecting them; a rocky ledge extends 4 cables north-westward of Peak rock, near the northern edge of which there are rocks always above water.

**The channel** between Tuni ang island and Teyi point is clear, with the exception of the rocks above mentioned. Cone islet, and an islet westward of it, are each about 2 cables southward of Tuni ang.

**Samun island** is  $1\frac{3}{10}$  miles in length, north-east and south-west, about 4 cables in breadth, 268 feet high, and distant one mile southward from Tuni ang; the channel between it and Cone islet is not quite 2 cables wide, with 8 fathoms water in the fairway.

**Anchorage.**—In the north-east monsoon junks anchor in 9 fathoms, southward of Net islet and of Peak rock, and abreast a fort on Tuni ang, but the ground is foul within 2 cables of the fort point.

The best anchorage is in Samun road, westward of the south-western point of Cone islet in 7 to 8 fathoms, and sheltered from winds from between N.W., through north, to South.

During south-westerly winds there is anchorage in 9 and 10 fathoms on the northern side of Tuni ang, and also in 10 to 12 fathoms north-eastward of Cone islet, southern side of Tuni ang.

**Tides.**—It is high water, full and change, at Tuni ang, at 9h. 0m.; springs rise  $5\frac{1}{2}$  feet.

*Chart 3026, Macao to Pedro Blanco.*

**SINGLE ISLET** (Lat.  $22^{\circ} 24\frac{1}{2}' N.$ , Long.  $114^{\circ} 40' E.$ ),  $1\frac{3}{4}$  miles south-south-eastward of Samun island, is 200 feet high, with a rounded top.

**Akong**, a remarkable pyramidal rock, 100 feet high, lies 6 cables north-eastward of Single islet, with 15 fathoms between.

**Rock.**—A rock with a depth of  $2\frac{3}{4}$  fathoms, which rises abruptly from 13 fathoms, lies  $34^{\circ}$  true about one mile from Akong.

*Chart 3002, Bias bay.*

**BIAS BAY.**—The approach from the southward to Bias bay is between Tuni ang islets and Mendoza island, about 11 miles apart.

*General charts 3026, 1962, 2661b.*

*Chart 3002, Bias bay. Var. nil.*

The entrance to the bay is between Teyi point and Bias point, 8 miles north-eastward; the bay extends thence northward and north-eastward for about 17 miles, to its head, where is the village of Fan lo kong. A chain of islands fronts its western shore, occupying nearly half the bay, and leaving a clear passage between Lokaup island and Bate island off the eastern shore,  $3\frac{1}{4}$  miles wide, with depths of 8 fathoms. The western shore is indented by two large bays at the head of the southern of which is Taipung harbour; the northern is Dumbell bay.

The bottom is of mud, and there are no dangers outside the 3-fathoms contour line except Thornton rock, one foot high, situated half a mile northward of Bate island on the eastern side, and Harry rock northward of the Pillars on the western side, and nearly abreast.

**Middle rocks** (*Lat.  $22^{\circ} 30\frac{3}{4}'$  N., Long.  $114^{\circ} 41\frac{1}{2}'$  E.*), awash at high water, are situated on the western side of the fairway of approach,  $42^{\circ}$  true, distant  $3\frac{3}{10}$  miles from Tunian, and nearly 4 miles eastward of Teyi point. A reef, which breaks at low water, lies 3 cables south-westward of the rocks.

**Fishing stakes.**—The whole of the upper part of the bay, from Narrow islet to its head, Fan lo kong harbour, is often thickly studded with strong fishing stakes connected with stout rope gear, which are serious obstacles to navigation by night. A clear passage may be found on the eastern side of the bay, near Tsang chau.

**Taipung harbour**, on the south-western side of the bay, so named from the walled town Taipung on its northern shore, although contracted, affords good shelter to moderate-sized vessels, except with easterly winds. On the northern side of the harbour is Cone hill, off which a shallow flat extends half a mile; the southern side, which is bold-to, must therefore be kept aboard. Vessels above 15 feet draught should not proceed further westward than the third point on the southern side, as the head of the harbour is shallow.

**Dumbell bay**, the inlet northward of Taipung harbour, trends westward 6 miles from Big island, and has a general depth of 2 to 3 fathoms.

**Islands and dangers.**—**Lokaup island**, the southernmost of the chain of islands in Bias bay, is about 2 miles long, and nearly separated in two places; the highest part, 330 feet above the sea, is on the southern portion; off Pyramid point, its south extreme, are some pointed rocks. A reef extends 4 cables from the northern point of Lokaup, near the northern end of which is Lokaup rock, 4 feet high.

There is anchorage on either side of the island, according to the direction of the wind.

There are six islets around Lokaup, three on the south-west, two on the north, and one on the east, the latter named Flat or Cake island.

*General charts 3026, 1962, 2661b.*

*Chart 3002, Bias bay. Var. nil.*

The Pillars, the northern islet 89 feet in height, is remarkable from two square pillars on its southern side.

**Harry rock**, with a depth of  $4\frac{1}{2}$  fathoms, and  $5\frac{1}{2}$  to 7 fathoms around, is situated with the Pillars bearing  $166^{\circ}$  true, distant  $4\frac{1}{2}$  cables.

**Middle group**, about one mile northward of the Pillars, consists of six islets. Green islet, 262 feet high, the southern, has Hat rock close south-westward of it, and there is a rock with  $2\frac{1}{4}$  fathoms water  $1\frac{1}{2}$  cables eastward of it.

Square islet, 106 feet high, is about 4 cables north-north-eastward of the eastern end of Green islet, whence Hole islet, 87 feet, Red islet, 255 feet, and Tree islet, 117 feet high, continue northward for  $1\frac{1}{4}$  miles.

Reef islet, 179 feet high, lies about a mile northward of Green islet; there is a reef that breaks at low water a quarter of a mile south-eastward of it, and a rock, awash at low water, 3 cables northward of it.

**Harbour group** consists of nine islets; the southern are the Twins, two small islets, 106 feet high, situate about 9 cables northward of Tree islet; at a quarter of a mile north-eastward of the Twins is Shoal islet, 236 feet high, with rocky ground extending 3 cables north-westward from it, on some parts of which the depth is only 3 feet. At a quarter of a mile westward of the Twins is Tree-a-top islet, 97 feet high, with Sugarloaf island, 320 feet high, half a mile further westward.

Fairway rocks, awash at low water, lie nearly 6 cables south-westward of Tree-a-top islet.

Narrow islet, three-quarters of a mile long, north and south, 2 cables wide, and 281 feet high, is 3 cables northward of Shoal islet. A shoal with  $2\frac{3}{4}$  fathoms water extends west-north-westward nearly a mile from between Shoal and Narrow islets, and there is a  $2\frac{1}{2}$ -fathoms patch a mile westward of Narrow islet.

Round islet, 198 feet high, lies  $2\frac{1}{2}$  cables northward of Narrow islet, with a depth of  $4\frac{1}{4}$  fathoms between them; about one cable northward of it is Flat rock, nearly awash and steep-to. At 6 cables north-westward of Round islet is Cone islet, 113 feet high, surrounded by reefs; and groups of islets and rocks extend west-north-westward from Round islet to the mainland northward of Dumbell bay.

**Big island**, 6 cables north-eastward of the south point of Dumbell bay, is about 8 cables long, 4 cables wide, and 364 feet high. North Tree islet, 132 feet high, is close off its northern side, and 3 cables further northward is North rock, a flat rock with a reef, which shows only at low water. Sand cay, a low rock surrounded by sand, lies

*General charts 3026, 1962, 2661b.*



*Chart 3002, Bias bay. Var. nil.*

4 cables north-westward of Big island, and there is a rock awash at high water near the southern side of Big island.

**Fisherman rock**, nearly in mid-channel between Big island and the main, shows at half tide.

**Low islet**, 125 feet high, with another islet immediately north-westward of it, lies  $1\frac{1}{4}$  miles northward of Cone islet; Kai pan rock, over which there is less than 6 feet at low water, lies  $253^{\circ}$  true, one mile from Low islet. For others westward, *see* the chart.

**EASTERN SHORE.**—**Bias point**, the eastern point of entrance to Bias bay is the extreme of a peninsula with three peaks, the eastern and highest being 380 feet in height.

**A rocky ridge** extends about 6 cables south-south-west of the point, with a rock 3 feet high at its extreme, and others of 35 feet and 5 feet nearer the point. The point is foul to a distance of  $2\frac{1}{2}$  cables westward of it. There is a flagstaff on the point, and there is a conspicuous sand-patch, and also a glass-factory chimney in the bight northward of it.

The coast northward, from Bias point to Whaler point, is fronted by shallow water, including Triple islet.

A rock with 8 feet water is situated  $6\frac{1}{2}$  cables eastward of Bias point.

**Bate island** (*Lat.  $22^{\circ} 35' N.$ , Long.  $114^{\circ} 43' E.$* ), 293 feet high, and wooded, is situated  $1\frac{1}{2}$  miles westward of Bias point; it is 7 cables long, north and south, and half a mile broad. Foul ground extends  $1\frac{1}{2}$  cables from the north side, on the outer part of which is situated Maung pai, a rock awash.

**Thornton rock**, one foot high, lies 6 cables north-north-eastward of the north extreme of Bate island.

**Little Bate island**, a bare rock 55 feet high, is situated 3 cables south-eastward of Bate island, with depths of from  $4\frac{1}{2}$  to 8 fathoms in the channel between.

**Depths.**—In the channel between Bate island and the foul ground off Bias point are depths of from  $3\frac{3}{4}$  to 7 fathoms, mud and sand.

**Triple islet**, with its highest and southern peak, 147 feet high, lies half a mile off-shore at  $2\frac{1}{4}$  miles northward of Bate island; at one cable eastward of its southern part is a rock awash at low water.

There is anchorage in the north-east monsoon, westward of Triple islet, in about 6 fathoms.

**Coast.**—Northward of Whaler point the eastern shore is fronted by shallow water out to a line joining the point with Tsang chau;

*General charts 3026, 1962, 2661b.*

*Chart 3002, Bias bay. Var. nil.*

near the shore there are numerous sunken rocks extending a distance of 2 miles southward of that island.

**Tsang chau**, a flat-topped, inconspicuous islet, 95 feet high, and about one-third of a mile long in an east and west direction, is situated  $1\frac{1}{2}$  miles southward of the entrance to Fan lo kong; a narrow bank of stones, which dries, extends  $1\frac{1}{2}$  cables from its north-east extreme, and some rocks above water lie off the western end. A small islet, 64 feet high, and on which there is a conspicuous tree, is situated  $1\frac{1}{2}$  cables south of Tsang chau.

**Fan lo kong harbour** is the head of Bias bay; it is about 5 miles in length,  $1\frac{1}{4}$  miles in breadth, with a depth of about  $3\frac{1}{2}$  fathoms over the central portion of it. It is barred by a flat, which extends across its entrance from Buffalo point and Tsang chau with a low water depth of  $2\frac{3}{4}$  fathoms. The depths are under 6 feet for  $1\frac{1}{2}$  miles off the town of Fan lo kong at its head. This is said to be the best anchorage in Bias bay during a typhoon.

**Aspect.**—The harbour is surrounded by high hills; Sao chai shan, on the northern side, is 1,374 feet high, and the ranges near the southern side of the harbour attain an elevation of about 1,000 feet.

The hills within those on the southern side are high and well cultivated; Mount Bisbee, 1,989 feet high, and Mount Hewett, 1,918 feet high, are conspicuous.

There are numerous small villages on these hills, and the valleys between are well cultivated.

**Buffalo point**, the south entrance point of Fan lo kong harbour, is situated one mile east-north-eastward of Tsang chau, and from thence the coast, formed by rocky points and fronted by mud-flats, trends north-eastward to the head of the harbour.

**Tai pai tau**, the north entrance point of Fan lo kong harbour, is a high rocky point, with rocks above water lying three-quarters of a cable off it; the one-fathom contour line extends from 2 to 4 cables off-shore eastward of it, towards the head of the harbour.

**Fan lo kong** is situated on a well-cultivated plain, backed by high hills, and with a population of about 4,000, and a resident magistrate.

**Supplies.**—Fowls, eggs, and fruit are abundant, but wood is scarce. Fresh water for washing purposes can be obtained.

**Communication.**—There is daily communication by steam launches between Hong Kong and Dumbell bay on the west side of Bias bay.

*General charts 3026, 1962, 2661b.*

*Chart 3002, Bias bay. Var. nil.*

**Port reef**, with 4 feet water, lies on the north side of the bar, at  $4\frac{1}{2}$  cables south-eastward of Tai pai tau.

**Northern shore of Bias bay**.—At one mile north-westward of Tai pai tau the coast becomes low and sandy for about  $2\frac{1}{2}$  miles to Wu shan tau, a prominent headland 360 feet high.

**Sai pai rock**, with 5 feet water, and 2 fathoms around, lies 8 cables off the joss-house in the bay westward of Tai pai tau.

**Fu chau** is a small islet, 130 feet high, connected with the mainland at low water, situated three-quarters of a mile westward of Wu shan tau.

**Po top chau**, 85 feet high, with a pagoda on its summit, lies about  $3\frac{1}{2}$  cables off the northern shore of the bay, at  $4\frac{1}{2}$  miles westward of Tai pai tau, with sunken rocks extending south-west of it.

**DIRECTIONS**.—Approaching Bias bay the only danger, and that is generally visible, is Middle rocks, which will be avoided by keeping Bate island northward of  $6^\circ$  true until the summit of Mendoza island bears southward of  $96^\circ$  true.

Thence, in the north-east monsoon period, proceed up the bay to an anchorage in 5 to 6 fathoms, about a mile westward of Triple island, on the eastern shore, or to Fan lo kong harbour, at the head of the bay, but there is anchorage all over the eastern part of the bay in this monsoon, according to draught.

In the south-west monsoon there is anchorage on the western shore in and off Tai pung harbour in any required depth.

There are several populous villages on the eastern shore where small supplies might be obtained, as well as at the head of the bay before mentioned.

**Tides**.—It is high water, full and change, at Tsang chau, at 9h. 46m.; springs rise  $9\frac{1}{2}$  feet, and neaps rise  $7\frac{1}{2}$  feet. The tides are irregular, a double high water being observed in October and November, the second occurring from  $3\frac{1}{2}$  to 4 hours later than the first, and the water level falling about one foot between the two.

This double tide was not so marked at the lower high water nor at neaps.

**Tidal streams**.—The directions of the tidal streams turn with the high and low waters by the shore, attaining at springs a velocity of three-quarters of a knot.

**MENDOZA ISLAND** (*Lat.  $22^\circ 31' N.$ , Long.  $114^\circ 50\frac{1}{2}' E.$* ), lies in the eastern approach to Bias bay, at  $7\frac{1}{2}$  miles south-eastward of Bate island; it is 480 feet high, about a mile in extent, and from

*General charts 3026, 1962, 2661b.*

*Chart 3002, Bias bay. Var. nil.*

some directions shows two peaks rather like a saddle; shelter may be obtained from south-westerly winds on its north-eastern side. On its western side is an islet, with a boat channel between.

**Tsinku islet**, 167 feet high, lies 6 cables northward of Mendoza, with depths of 11 fathoms between; near its centre is a remarkable cleft.

**COAST.**—**Fokai point**,  $3\frac{3}{4}$  miles north-eastward of Mendoza, is the south-eastern extreme of a promontory connected with the main by a low sandy isthmus; the promontory is 670 feet high, and appears from a distance as an island on easterly or westerly bearings. On the hill over the south-western point is a fort.

On the north-western point of Fokai is a fort, with a tall chimney on the hill beyond it; northward of the fort is a creek, which runs northward through the sandy isthmus, and which junks enter at high water.

**Middle rock**, 10 feet high, lies 6 cables westward of the south-western point of Fokai promontory, and may be passed on either side.

**Harlem bay**, westward of Fokai isthmus and promontory, affords anchorage, in the north-east monsoon, northward of Hebe islet in any convenient depth of water.

Hebe islet, 70 feet high, is flat-topped, and is situated on a shallow flat extending from a ledge of rocks, covered at high water, which extends 3 cables north-eastward of it. A  $3\frac{1}{2}$ -fathoms rocky patch lies 3 cables south-westward of Hebe islet.

**Supplies** of fish and vegetables are usually obtainable from the native villages.

**Tidal streams.**—In April, the current off Bias bay was found to be setting constantly westward, its rate, which did not exceed one knot, increasing with the flood. When the monsoon drift-current recedes from the coast, tidal influences prevail, and the flood stream is said to set westward and the ebb eastward.

**Directions.**—Entering Harlem bay from the eastward, round Fokai point at the distance of about half a mile. With easterly winds in a sailing vessel of moderate size pass eastward of Middle rock and fetch the anchorage without tacking, avoiding the  $3\frac{1}{2}$ -fathoms patch south-westward of Hebe islet; a large vessel should pass westward of Middle rock.

*Chart 3026, Macao to Pedro Blanco.*

**Off-lying rocks.**—**Whale rocks**,  $113^{\circ}$  true, distant  $6\frac{3}{10}$  miles from Fokai point, are two rocks, on which the sea sometimes breaks, with depths of 12 fathoms close around.

*General charts 3026, 1962, 2661b.*

*Chart 3026. Var. nil.*

**Pauk piah**, a flat rock about 25 feet high, lies 90° true, distant 6½ miles from Fokai point and 13° true from Whale rocks.

**PEDRO BLANCO** (Tai sing cham) (*Lat.* 22° 19' *N.*, *Long.* 115° 7½' *E.*).—This rock, 140° true, 18½ miles from Fokai point, is about 130 feet high, steep-to at the distance of a quarter of a mile with deep water beyond; on northerly bearings it appears as two rocks; the summit is white, hence its name.

For the Coast of China north-eastward of Fokai point, *see* China Sea Pilot, Vol. V.

*General charts 1962, 2661b, 1262.*

## APPENDIX I.

### LAW ON NAVIGATION IN SIAMESE WATERS.

#### (Extracts.)

##### LIMITS OF THE REGULATIONS.

2. The regulations contained in the Law on Navigation in Siamese Waters apply to the harbour of Bangkok, the harbour of Koh-si-Chang, the anchorage of Anghin, the anchorage outside the Bar, the River Chow Phya (Chau Fya or Bangkok river), and all other harbours, anchorages, rivers, and canals within His Siamese Majesty's dominions.

This decree of His Majesty the King of Siam is binding upon, and shall be observed by all British subjects in Siam.

#### Chapter I.

Limits of the several anchorages referred to in these paragraphs will be found with the ports, in the preceding pages of the volume.

7. The limits of all other ports in Siam shall be fixed in special decrees concerning each of them.

#### Chapter II.—Duties of Masters.

##### A.—ON ENTERING SIAMESE WATERS.

8. Every master of a merchant ship shall hoist her colours on entering Siamese waters, and shall keep such colours flying until the ship shall have been boarded by the Harbour master or his deputy.

##### B.—ON ENTERING OR GOING OUT OF THE RIVER.

9. Every vessel entering the Chow Phya river (River Menam), shall stop on arriving at the Guard Station at Paknam, and if necessary cast anchor there and allow the Medical Inspector and the Custom-house officials to come on board. Such Custom-house officials shall proceed in her to Bangkok, and shall remain on board until due permission to discharge shall be obtained, or until they shall be relieved by Custom-house officials of Bangkok.

On request of the Custom-house officer the master of the vessel shall fill up a form stating name of his vessel, the number of the crew and passengers, and the place from whence she comes.

A report shall also be made of arms, ammunition, and explosives carried on board, and if required so to do the master shall deliver all arms, ammunition, and explosives into the custody of the Custom-house officer in charge.

The master of every Siamese vessel going out of the Menam river shall report her intended departure to the Harbour master in Bangkok, and the master of every Siamese or foreign vessel shall obtain a pass at the Custom-house in Bangkok. Every vessel shall stop on arriving at the Guard Station at Paknam, and if necessary cast anchor there in order to allow the Custom-house officer to come on board and take delivery of the pass.

10. The master of every vessel entering or going out of any other port or river of the kingdom of Siam shall cast anchor at the guard station of such port or river, report his arrival to the officer of the station, and follow the instructions which such officer shall give him.

11. Should the master of any vessel fail to comply with the above-mentioned provisions, he shall be liable to a penalty not exceeding 800 ticals.

#### C.—ON ENTERING THE PORT OF BANGKOK.

12. The master of every Siamese vessel shall, within 24 hours (unless a Sunday or holiday intervenes) after the arrival within the limits of the port of Bangkok, report the arrival of his ship at the Harbour master's office.

13. If it be a Siamese vessel or a foreign vessel that does not belong to a nation represented by a consul, the master shall also deposit at the said Harbour master's office the ship's articles, list of passengers, the ship's register, and true copy of manifest if required.

If it be a foreign vessel belonging to a nation represented by a consul, the said papers shall be lodged at the proper consulate; the master of such a vessel, however, shall, on being boarded by the Harbour master or his deputy, fill up the book handed to him in the form hereto annexed, giving at the same time a correct list of all passengers and an account of any accidents or deaths that may have happened during the voyage.

A copy of the harbour regulations shall be handed to the master of every vessel in case he has not already been provided with the same. The price shall be ticals 2.

14. Any master offending against the provisions of Sections 12 or 13 shall be liable to a penalty not exceeding 400 ticals.

### Chapter III.—Anchorage.

15. Within the limits of the port of Bangkok every vessel not made fast alongside a wharf or landing shall be moored by two anchors mid-stream, and on no account shall any vessel anchor or moor in the fairways.

16. There shall be two fairways.

(1) The eastern or main fairway comprising the space of the river, within the limits of the port of Bangkok, extending between the vessels anchored midstream and the east bank of the river or the

vessels made fast to the East bank of the river, or the floating houses made fast along the east bank of the river.

(2) The western fairway, comprising the space of the river between the vessels anchored midstream and the west bank of the river, or the vessels made fast to the west bank of the river, or the floating houses made fast along the west bank of the river.

17. Lorchas, lighters, junks, cargoboats, and other small craft shall moor in the middle of the river, or when possible may moor to the westward, provided that a clear passage of not less than 300 feet shall always be left open between them and the west bank of the river, or the vessels made fast to the west bank of the river, or the floating houses made fast along the west bank of the river.

18. No vessel shall anchor in the space of the river comprised between Klong Taphan Han and Klong Bang Lamphu Bon except in case of emergency. This space of the river shall at all times be reserved for Siamese vessels of war. It shall not be lawful for sea-going or armed vessels to navigate up the river beyond Klong Taphan Han without special permission granted by the Harbour master.

19. It shall be lawful for the Harbour master or his deputy, at any time, to appoint the berth to be taken up by any vessel or small craft, in which case the master of the said vessel or small craft shall take up the berth pointed out by the Harbour master or by any person sent on board by him for that purpose, and shall not remove from it to take any other berth without the Harbour master or his deputy's permission, except in case of necessity, to be decided by the Harbour master or his deputy.

20. In small rivers and canals all boats shall moor on either side of the river or canal, so as not to obstruct navigation in the middle of the stream. They shall not be moored one abreast of another nor athwart of the river or canal, nor in the middle of the stream.

21. At any wharf and landing on the banks of the River Chow Phya (Bangkok river), or on each side of any vessel, cargo boats, launches, and other craft shall not make fast abreast of one another to a greater number than two, and not more than one shall make fast abreast of any floating house.

No raft of a greater width than 20 logs abreast shall make fast on each side of any vessel or alongside any wharf or landing, and not more than one lorcha, lighter, or junk abreast shall make fast on each side of any vessel, and not more than two alongside any wharf or landing.

Lorchas, lighters, junks, cargo-boats, launches, and other craft and rafts shall not make fast to the bank of the river in such numbers or in such a manner as to project into the fairway or cause obstruction to navigation.

The restrictions in this section may be relaxed by special permission of the Harbour master.



22. The master of any vessel, lorch, lighter, junk, cargo-boat, launch, raft, or small craft offending against the provisions of this Chapter III. shall be liable to a penalty not exceeding 150 ticals.

### Chapter IV.—Fairways.

#### A.—EASTERN OR MAIN FAIRWAY.

23. All steamships of any tonnage (with the exception mentioned in Section 27), sailing vessels of all descriptions exceeding 50 tons displacement shall, either going up or down the river, keep to the Eastern fairway except in case of emergency, or in order to proceed to or from any wharf or bank of the river.

24. All such vessels shall proceed at the lowest speed consistent with the most prudent navigation, due regard being had to the vessel's own safety, and to the possible injury done by the wash of the vessel.

25. No steamship shall navigate within a distance of 100 feet from the bank of the river, or from the ships made fast to the bank of the river, or from the floating houses made fast along the bank of the river, except when necessary in order to avoid collision.

#### B.—WESTERN FAIRWAY.

26. All sailing vessels under 50 tons displacement and generally vessels of all descriptions not provided for by Section 23 shall keep to the Western fairway.

27. As an exception to the rule laid down in Section 23, all steamships towing more than one other ship under 25 tons shall keep to the Western fairway.

It shall not be lawful for any steamship to tow within the limits of the port of Bangkok a greater number of ships than will enable such steamship to proceed at rate of 2 miles an hour over the ground, and such steamship shall not proceed at a higher rate of speed than 6 miles an hour over the ground when going against the tide, and 4 miles an hour through the water when navigating with the tide.

The number of boats towed shall in no case exceed 32, and there shall not be more than four boats towed abreast.

The master of the towing vessel shall see that after dusk, while under tow or at anchor, lights shall be exhibited by the boats towed, in such a manner as to indicate clearly the length and breadth of the tow.

28. No steamship towing more than one other ship, and no sailing vessel, shall navigate within a distance of 100 feet from the bank of the river, or from the ships made fast to the bank of the river or from floating houses made fast along the bank of the river.

29. Any person offending against the provisions of Sections 23, 24, 25, 26, 27, or 28 shall be liable to a fine not exceeding 500 ticals.

## Chapter V.—Offences.

### A.—CABLES AND ROPES FASTENED TO THE BANK OF THE RIVER.

35. No vessel shall fasten cables or ropes to the banks of the river, except such vessels as shall be fastened alongside a wharf when no passage is left between such vessels and the shore.

36. Any person offending against the provisions of Section 35 shall be liable to a fine not exceeding 200 ticals.

### B.—BUOYS AND MOORINGS.

37.—No person shall keep or place moorings or buoys in the waters of the River Chow Phya, except with the sanction of the Harbour master, and except upon such conditions and subject to the payment of such fees as the Harbour master may direct.

38. No person shall moor or anchor hulks or vessels of like description in the waters of the River Chow Phya without the sanction of the Harbour master, and except upon such conditions and subject to the payment of such fees as the Harbour master may direct.

39. Moorings or buoys sanctioned by the Harbour master under Section 37, shall not be made use of by any vessel other than the vessels of the person to whom such sanction has been granted except with the consent of such person. The master or person in charge of any boat offending against the provisions of this section or of Sections 37 or 38 shall be liable to a fine not exceeding 200 ticals.

### C.—THROWING BALLAST INTO NAVIGABLE RIVERS, HARBOURS, AND ANCHORAGES.

40. Any person who, without the consent of the Harbour master, throws stones, gravel, ballast, or anything likely to form a bank or shoal in or near the channel over the bar of a navigable river, or in any part of such rivers, or in any harbour or anchorage, shall be liable to a fine not exceeding 1,000 ticals over and above expenses which may be incurred in removing the same.

### D.—STEAM WHISTLES.

41. No steamship or steam launch either at anchor or under way shall use her steam whistle except for the purpose of navigation and to avoid collision; nor shall the signal be unduly or wantonly prolonged. The use of the siren whistle is forbidden within the limits of the harbour of Bangkok.

### E.—FIRING OF GUNS.

42. No person shall, without a permit from the competent authority, fire any guns except for the purpose of making a signal of distress.

### F.—DRUMS, GONGS, AND FIREWORKS.

43. No person shall, without a permit from the competent authority, beat any drum or gong, discharge, kindle, or let off any fireworks, or

attempt to do so, within the limits of the port of Bangkok between the hours of 10 p.m. and 6 a.m.

Any person offending or causing another person to offend against the provisions of this section or of sections 41 or 42 shall be liable to a fine not exceeding 100 ticals.

### **Chapter VII.—Caution to Masters of Vessels.**

62. Masters of vessels are requested to inform their crews, when granting them leave, that they are not to come on shore with sheath knives or other dangerous weapons, such as slung shots, &c.

Any man found with any of the above on his person may be arrested and locked up by the police, and the article may be forfeited.

If he belongs to any foreign nationality represented by a Consul, he shall be handed over to the proper Consul, who shall adjudge the case according to law.

## **PART II.—RULES OF THE ROAD.**

These are the same as in force in the British islands and elsewhere.

93. **DISTRESS SIGNALS.**—When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:—

In the day time:

- (1) A gun fired at intervals of about a minute.
- (2) The International code signal of distress, indicated by N.C.
- (3) The distance signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.
- (4) Rockets or shells as prescribed below for use at night.
- (5) A continuous sounding with any fog signal apparatus.

At night:

- (1) A gun fired at intervals of about a minute.
- (2) Flames on the vessel, as from a burning tar barrel, oil barrel, &c.
- (3) Rockets or shells, bursting in the air with a loud report and throwing stars of any colour or description, fired one at a time at short intervals.
- (4) A continuous sounding with any fog signal apparatus.

## **PART IV.—SPECIAL REGULATIONS.**

### **Chapter I.—Rules and Regulations for Vessels and Boats Carrying “Dangerous Goods.”**

131. By dangerous goods are understood aquafortis, vitriol, naphtha, benzine, gunpowder, lucifer matches, nitro-glycerine, petroleum, and other goods of a dangerous nature.

132. Any vessel on entering any Siamese harbour or river having on board dangerous goods within the meaning of the above-mentioned

paragraph, or to which such paragraph applies, and any vessel about to take on board any such goods as aforesaid, shall anchor at such place in the harbour or river as shall be pointed out by the Harbour master or his deputy; and the said vessel shall not be removed therefrom without the permission of the Harbour master.

133. The transhipment of any dangerous goods, as aforesaid, shall not take place between the hours of 6 p.m. and 6 a.m. without the written permission of the Harbour master.

134. Dangerous goods, as aforesaid, shall not be landed from the importing vessel elsewhere than at the places appointed or licensed for such purposes.

135. When any dangerous goods as aforesaid are being transhipped, shipped, landed, or moved from one place to another by water, they shall be conveyed in a covered boat, lorch, or vessel, on board of which there shall be no lights or fires; and the boat, lorch, or vessel carrying such goods shall display a red flag, and shall proceed without delay or interruption, and shall not anchor or stop at any place except for the immediate purpose of landing such goods.

136. The dangerous goods on board every such vessel, lorch, or boat, as aforesaid, shall, on her arrival at their destination, be immediately discharged by the owners or consignees of such cargo, and shall be then delivered, and if the owner or consignee of such cargo shall fail in doing so, it shall be lawful for the Harbour master or his deputy to have the same discharged at the expense of the said owner or consignee.

137. When any dangerous goods as aforesaid are about to be received into, or discharged out of, the licensed depôts, the owner or consignee of the same shall attend at the dépôt, or shall send a responsible representative instead, and any question which may arise as to the number or weight of cases received at or delivered out of the dépôt shall be decided at the time by such owner or his representative and the officer in charge of the dépôt, who shall, if necessary, refer the same to the Harbour master.

138. Every person who shall violate or refuse or fail to comply with the provisions of this chapter shall be liable to a penalty not exceeding 500 ticals, or imprisonment for any period not exceeding 6 months.

## **Chapter II.—Rules and Regulations in Relation to Petroleum in Bulk.**

139. In these rules the words "Petroleum in Bulk" shall mean petroleum and any product of petroleum, other than lubricating oils, in any vessels, tank, compartment, or receptacle having a capacity of 800 gallons and upwards, and the words "Tank Ship" shall mean any ship or boat conveying or intended to convey petroleum in bulk.

140. Every tank ship arriving in Siamese waters, having on board petroleum in bulk, and every ship being about to take on board such petroleum from premises licensed for storing petroleum in bulk, shall

hoist a red flag at her foremast head, and at her mainmast head shall hoist the flags T H E of the International code (signifying "Petroleum Oil"), and shall keep such flags flying during the hours of daylight whilst any petroleum is on board, and thereafter so long as she shall remain in Siamese waters, and during the same period every such ship shall by night display two red lights horizontally in a position where they can be best seen, and at a height of not less than 20 feet above the deck. Provided that if the Harbour master is satisfied that a ship after discharging the petroleum on board has been thoroughly emptied, cleaned, and ventilated, he may dispense with the requirements of this rule.

141. Every tank ship arriving at a Siamese port or river, having on board petroleum in bulk shall proceed at once to the wharf licensed for landing petroleum in bulk, and she shall not remove from such position without the permission of the Harbour master.

142. During the time that any tank ship having on board petroleum in bulk is within a Siamese port or river, no fires or lights except the electric light shall be used on board or in the immediate vicinity of the ship while the tanks or petroleum compartments are open or are discharging or receiving petroleum, or when the hatches are off, and no person on board shall smoke or carry matches. But this regulation shall not be deemed to prohibit galley fires and engine-room fires necessary to get up steam to move to or from the said wharf, or from the said wharf to go to sea, or to get up steam for discharging the petroleum on board.

143. The master of every tank ship arriving at a Siamese port, and having on board petroleum in bulk shall, on entering his vessel inward, and before proceeding to discharge any cargo, declare in writing to the Harbour master:—

- (a) What quantity of petroleum the ship is carrying.
- (b) The number of compartments or tanks in which oil is stored.
- (c) The nature and quality of the oil, and whether it is covered by any, and what, certificate from the port of shipment or any intermediate port of call as to the temperature at which the oil gives off an inflammable vapour.

144. Upon such a declaration being received, the Harbour master may give permission for the ship to proceed at once to discharge the petroleum as hereinafter provided.

145. The discharge of petroleum imported in bulk from a tank ship, and the shipment of petroleum from the premises licensed for storing petroleum in bulk, shall be effected by means of a hose and a wrought-iron pipe between sunrise and sunset. Petroleum so imported shall be pumped into storage tanks, and when the ship has finished discharging or shipping petroleum, the pipe shall immediately be emptied.

When the ship has not finished discharging or shipping by sunset,

arrangements shall be made by means of a valve or otherwise for effectually preventing any of the oil left in the pipe from escaping.

146. No discharge of petroleum, whether mixed with water or not, shall be permitted into the harbour or river from any tank ship, or from the licensed premises.

147. Not more than one tank ship shall go or be alongside the wharf at any time, nor when a tank ship is discharging or shipping petroleum shall any other ship, vessel, or junk of any description whatever be alongside the said wharf or tank ship.

148. No tank ship having on board petroleum in bulk, or which has recently been discharged thereof, shall, without the permission of the Harbour master, alter her position. If the Harbour master is satisfied that a tank ship has no petroleum on board and that her tanks have been thoroughly cleaned and ventilated, he may allow her to take up such position as he may assign.

149. Except where repugnant to or inconsistent with these regulations, and unless otherwise expressly provided, the rules and regulations for the time being in force under the dangerous goods regulations, in relation to the movement by land or water and the storage of dangerous goods and to the anchorage of ships, vessels, lorchas, or boats having taken, or being about to take, on board dangerous goods within Siamese waters, shall apply to the movement and storage of petroleum in drums or other vessels from the premises in which petroleum in bulk is licensed to be stored, and to the anchorage of ships, vessels, lorchas, and boats having on board or being about to take on board such petroleum.

150. Every person who shall violate or refuse or fail to comply with the provision of this chapter shall be liable to a penalty not exceeding 500 ticals, or imprisonment for any period not exceeding 6 months.

### Chapter III.—Regulations.

#### FOR ANCHORING NEAR TO OR CROSSING TELEGRAPH CABLES.

151. The line of telegraph cable crossing between the lighthouse known as "Regent's light" inside the bar of the Chow Phya (Bangkok) river, and the mainland, is marked on the shore side by posts carrying a large white circular disk.

No vessels of any description shall anchor within 100 yards on either side of this telegraph cable, nor shall they drag their anchors or any fishing net or apparatus across the cable.

152. The line of the telegraph cable crossing between the telegraph station at Paknam and the Fort Phi Sua Samuth (Fi sua smuth) is marked on either end by posts carrying a large white circular disk.

No vessels of any description shall, when arriving at Paknam, anchor to the northward of this cable, nor within 100 yards of the south side of it, nor shall they drag their anchors across it.

153. The line of telegraph cable crossing the River Chow Phya (Bangkok river), between north end Wat Maha That and Wang Lang, is marked on either end by posts carrying a large white disk.

No vessels of any description shall anchor within 100 yards of either side of this cable, nor shall they drag their anchors across it.

154. Should in the future any new line or telegraph or electric light or telephone cable be established across the Bangkok river, or any other river, such line shall be marked on either end by posts carrying a large white disk.

No vessels of any description shall anchor within 100 yards of either side of such cable, nor shall they drag their anchors across it. Any vessel offending against this provision shall incur the penalty provided in Section 155.

155. The master or other person in charge of a vessel of any description, anchoring within the limits forbidden by these regulations, or dragging his anchor or any fishing net or fishing apparatus across the limit forbidden by these regulations, shall for each offence be liable to a penalty not exceeding 100 ticals, without prejudice to any liability he may be under to repair any damage caused to any telegraph or electric light or telephone cables in consequence of so anchoring or of so dragging his anchor, fishing net, or other fishing apparatus.

156. As far as concerns these regulations, vessels of any description shall be considered to be dragging their anchors, if such anchors are not visible above water at the time such vessels are passing the limits forbidden by these regulations.

### Chapter V.—Quarantine Regulations.

162. Whenever information is received that cholera, small-pox, plague, fever, or other contagious or infectious disease of a dangerous nature has broken out or exists at any other port or place without the country of Siam it shall be lawful for the Minister of Local Government to declare by notification in the *Government Gazette* and to the foreign Consuls, that such port or place is infected, whereupon all vessels arriving from such port or place shall be put in quarantine, and there detained until released by the Medical officer of the Local Government department or his deputy, which officers are hereinafter included in the term "The Health Officer."

163. The following are hereby declared to be the quarantine anchorages in Siamese waters:—

At the island of Koh Phra—Abreast of the quarantine station.

At the island of Koh-si-Chang—Abreast of the customs station.

At Anghin—Abreast of the customs station.

At Paknam in Bangkok river—Abreast of the customs station.

At Bangkok—Abreast of the police station at Bangkolem.

164. The quarantine station is on the island of Koh Phra.

165. The master or person in charge of any vessel arriving at or being in Siamese waters, having on board, or having had on board within 14 days previous to arrival, cases of plague, cholera, small-pox, fever, or other infectious disease of a dangerous nature shall, if arriving within Siamese waters, fly the quarantine flag, and remain at anchor at the quarantine anchorage until boarded by the Health officer, and released by him, or, if already within the port, forthwith fly the quarantine flag, and remove his vessel to a place approved by the Health officer.

166. The Health officer shall forthwith thereupon proceed to such vessel and make enquiry, and if he deems it necessary for the public health that the vessel and the people on board should be placed in quarantine, shall give orders to the master or person in charge of the vessel to place the vessel with the people on board in quarantine.

167. As soon as such orders are given it shall be the duty of the master or the person in charge of such vessel to cause his vessel to be taken to such place as may be pointed out to him as the quarantine anchorage, there to remain in quarantine until released under provisions of these regulations.

168. All vessels ordered to the quarantine anchorage shall have displayed by day the usual quarantine or yellow flag at the foremast head with the commercial code pennant under it, and by night at the foremast head a red light.

169. All guard boats shall display a similar yellow flag at the stern by day, and from sunset to sunrise a light at bow and stern.

170. Vessels in quarantine shall not be removed therefrom without the written permission of the Health officer.

171. No boat except that of the Health officer shall be allowed alongside of any vessel in quarantine, no person shall be allowed to communicate with any vessel in quarantine, and no person on board shall be allowed to communicate with the shore, except in either case through the Health officer.

172. In all cases of vessels arriving at any port of Siam having on board or having had on board within fourteen days previous to arrival any contagious or infectious disease of a dangerous nature, the post-office packets and mails shall be delivered to the Health officer, who, after subjecting the same to such fumigation or other preventive process as he may judge necessary, shall forward the same to the post office of the port.

173. It shall be lawful for the Health officer, under such precaution to prevent contagion as may be from time to time approved of by the Minister of Local Government, to allow any steam vessel passing through the harbour to take supplies of coals, water, and provisions, and to land cargo.

174. It shall be lawful for the Health officer to require all or so many of the persons on board any vessel in quarantine as he may think



fit to be taken to the lazaretto or quarantine station of the port, there to be kept and attended to during such length of time as the Health officer may deem proper, before allowing them to return on board the ship, or be transferred to any other ship, or communicate with the shore.

175. Whenever any persons are detained in quarantine at the quarantine station a yellow flag shall be kept hoisted by day at a conspicuous place on the station, and by night a red light shall be displayed.

176. No person except the Health officer, or person authorised by him, shall land at the quarantine station when the quarantine flag is flying or quarantine light is shown.

177. The Commissioner of Police shall, on the requisition of the Health officer, supply the necessary guards required to enforce the quarantine regulations in respect to the quarantine station.

178. No person who has been detained in quarantine at the quarantine station shall, on any pretence whatsoever, leave such station till he has been admitted to pratique by the Health officer.

179. Any person going on board any vessel undergoing quarantine or entering or landing at any quarantine station without the permission of the Health officer, shall be liable to be detained in quarantine for such period as the Health officer may deem proper.

180. The master of a vessel in quarantine shall, if required by the Health officer, furnish the necessary boats and appliances for the landing of the passengers and crew at the quarantine station.

The remaining paragraphs, 181-193, will be found in the full copies of the regulations.

The full tariff of pilotage will also be found in the regulations.

# APPENDIX II. PARTICULARS OF DRY DOCKS, PATENT SLIPS, &c.

Port.	Name of Dock.	Length.		Breadth of Entrance.	Depth at H. W. O. S.		Lifting Power.	Date Built or in formation.	Remarks.
		On Blocks.	Over all.		On Sill.	On Blocks.			
Bangkok	Government .....	Feet 275	Feet 306	Feet 60	Feet 12 $\frac{1}{2}$	Feet 12 $\frac{1}{2}$	Tons —	1897	
	Bangkok Dock Co. No. 1	260	300	60	12	12	—	1897	
	" " 2	120	130	25	7 $\frac{1}{2}$	7 $\frac{1}{2}$	—	1897	
	Samsen .....	205	215	33	13	13	—	—	
Haifong	Patent Slip .....	116	—	—	Forward	5	300	—	
	(cradle)	(cradle)			Aft	10 $\frac{1}{2}$		—	
	New Dock .....	455	500	58	22 $\frac{1}{2}$	—	—	—	Intended.
	Patent Slip .....	130	—	—	Forward	6	400	—	
Saigon	Floating Dock .....	200	—	73	—	10	1,500	—	
	(cradle)	(cradle)			Aft			—	
	Government, large ..	508	545	68	30	—	—	1894	
	" small ..	—	230	32 $\frac{1}{2}$	9 $\frac{1}{2}$	—	—	1894	
Hong Kong	Floating Dock .....	400	—	66	—	—	10,000	—	Building, 1909.
	No. 1 Dock (Govt.)	552 $\frac{1}{2}$	568 $\frac{1}{2}$	93 $\frac{1}{2}$	39 $\frac{3}{4}$	39 $\frac{3}{4}$	—	—	At Royal Naval Yard; 576 and 592 feet in length respectively, with caisson in outer stop.
	Kau lung No. 1 ....	561	563	83	29	27 $\frac{1}{2}$	—	1903	
	" " 2 ....	371	371	74	19 $\frac{1}{2}$	17 $\frac{1}{2}$	—	1899	
	" " 3 ....	264	264	49	13 $\frac{1}{2}$	10 $\frac{1}{2}$	—	1899	
	Cosmopolitan Dock :—								
	As two docks, Inner	—	210	61 $\frac{1}{2}$	—	—	—	1903	
	Outer	—	210	78	20	18 $\frac{1}{2}$	—	—	
	As one dock ....	435	460	61 $\frac{1}{2}$	Forward	13	—	—	
	Patent Slip No. 1 ..	240	—	39	Aft	21	1,200	1903	
	(cradle)	(cradle)		(cradle)	Forward	8	1,000	1903	
	" " 2 ..	200	—	37	Forward	15			
	(cradle)	(cradle)		(cradle)	Aft				

PARTICULARS OF DRY DOCKS, PATENT SLIPS, &C. (*Continued*).

Port.	Name of Dock.	Length.		Breadth of Entrance.	Depth at H.W.O.S.		Lifting Power.	Date Built or in formation.	Remarks.
		On Blocks.	Over all.		On Sill.	On Blocks.			
Hong Kong ( <i>continued</i> )	Aberdeen : Hope Dock	Feet 430	Feet 430	Feet 81	Feet 23	Feet 21	Tons —	1896	
	Lamont Dk	333	340	64	16	13	—	1896	
	Taikoo Dk., Quarry Bay	787	790	86½	34½	34½	—	1904	
	Patent Slip No. 1 ..	250	—	—	Forward	15½	2,700	—	
	" " 2 ..	(cradle)	—	—	Aft	25	2,000	—	
	" " 3 ..	(cradle)	—	—	Forward	15½	2,000	—	
		230	—	—	Aft	24			
		(cradle)	—	—	Forward	15½			
					Aft	24			

## APPENDIX III.

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS  
OF DEPTHS, &c.

Port.	Depth at L. W. O. S. in channel of approach.	Depth at L. W. O. S. in anchorage.	Rise of Tide.	Remarks.
Bangkok harbour ..	3 to 6 feet on bar.	Fathoms 5½ to 6	Feet 9 to 11	Outside, bar in any depth.
Bingkoi bay .....	Deep .....	6 to 9	4 to 6	
Canton harbour ....	About 12 feet..	3 to 3½	6½ to 8	
Fuyen bay .....	Deep .....	6 to 9	6	
Haifong harbour ....	15½ feet .....	4 to 8	10	
Ha long bay .....	6 to 8 fathoms	6 to 8	12	
Hoi hau bay .....	Deep .....	4 to 8	6	
Hong Kong harbour :				
East entrance ....	6 fathoms.....	6 to 8	6½ to 8	
West entrance ....	4 fathoms.....	—	—	
Kam Ranh harbour..	Deep .....	6 to 8	6	
Kwang chau wan ..	21 feet .....	10	10 to 18	In Hoi Teou road, Matshi river.
Pakhoi .....	19 feet .....	22	11 to 16	
Saigon harbour ....	23 feet in channel of river.	5 to 7	12	Anchorage off the city.
Tourane bay .....	Deep .....	4 to 8	4	
Yu lin kan bay ....	7 to 8 fathoms	6 to 7	2	

# APPENDIX IV. PLACE—BANGKOK. OBS. Δ LAT. 13° 38' N., Long. 100° 27' E. METEOROLOGICAL TABLE COMPILED FROM 10 TO 21 YEARS' OBSERVATIONS.

MONTH.	BAROMETER * At 88° F. and Mean Sea Level.				AIR TEMPERATURE.								Relative Humidity.		RAIN.			* WIND.										No. of Days Gale.	No. of Days Fog.	
	Mean.		Absolute.		Mean.				Absolute.				For Month.	°	Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force Beaufort	Number of Days from											
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	N.	N.E.	E.	S.E.							S.	S.W.	W.	N.W.	Calm.							
January	Ins. 29-97	Ins. —	Ins. —	Ins. 76	° 17	° 93	° 59	° 34	°	2	Ins. 0-64	1	Ins.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
February	Ins. 29-92	Ins. —	Ins. —	Ins. 79	° 15	° 92	° 58	° 34	°	3	1-00	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
March	Ins. 29-89	Ins. —	Ins. —	Ins. 83	° 14	° 96	° 68	° 28	°	3	0-83	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
April	Ins. 29-84	Ins. —	Ins. —	Ins. 84	° 14	° 97	° 70	° 27	°	4	2-12	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
May	Ins. 29-79	Ins. —	Ins. —	Ins. 83	° 12	° 98	° 72	° 26	°	6	8-60	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
June	Ins. 29-77	Ins. —	Ins. —	Ins. 83	° 11	° 95	° 73	° 22	°	6	6-84	19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
July	Ins. 29-79	Ins. —	Ins. —	Ins. 82	° 11	° 96	° 72	° 24	°	6	6-66	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
August	Ins. 29-78	Ins. —	Ins. —	Ins. 82	° 12	° 96	° 72	° 24	°	6	6-33	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
September	Ins. 29-79	Ins. —	Ins. —	Ins. 81	° 11	° 94	° 73	° 21	°	7	11-25	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
October	Ins. 29-86	Ins. —	Ins. —	Ins. 80	° 11	° 93	° 69	° 24	°	6	7-66	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
November	Ins. 29-96	Ins. —	Ins. —	Ins. 79	° 13	° 93	° 60	° 33	°	3	2-43	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
December	Ins. 29-99	Ins. —	Ins. —	Ins. 75	° 15	° 91	° 57	° 34	°	2	0-10	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Means	Ins. 29-86	Ins. —	Ins. —	Ins. 81	13	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Absolute Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Yrs. Obsd.	20	—	—	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

\*Correction for Gravity = -0.7 in. Not applied.

Authorities :—" Report of Chief Signal Officer, U.S.A., 1891."

" Challenger " Report.

" Annales du Bureau Central Météorologique de France."

Meteorological Office,

January, 1912.

METEOROLOGICAL TABLE COMPILED FROM 3 TO 23 YEARS' OBSERVATIONS.

MONTH.	BAROMETER * At 32° F. and Mean Sea Level.				AIR TEMPERATURE.								Relative Humidity.				RAIN.				WIND.										No. of Days Gales.	No. of Days Fogs.
	Mean.		Absolute.		Mean.				Absolute.				Cloud Amount. Scale 0 to 10.		No. of Days.		Max. Fall in 24 hours.		Mean Force Beaufort Scale.	Number of Days from												
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	Total Fall.	No. of Days.	Max. Fall in 24 hours.	N.	N.E.	E.	S.E.		S.	S.W.	W.	N.W.	Calm.								
January	Ins.	Ins.	Ins.	Ins.	Ins.	79	88	71	17	92	64	28	76	%	Ins.	0.54	4	Ins.	2.52	—	—	—	—	—	—	—	—	—	—	—		
February	—	—	—	—	—	80	90	72	18	95	65	30	70	—	—	—	2	—	0.53	—	—	—	—	—	—	—	—	—	—	—		
March	—	—	—	—	—	84	93	75	18	101	70	31	71	—	—	—	1	—	0.25	—	—	—	—	—	—	—	—	—	—	—		
April	—	—	—	—	—	86	95	78	17	101	73	28	72	—	—	—	7	—	2.39	—	—	—	—	—	—	—	—	—	—	—		
May	—	—	—	—	—	85	92	78	14	100	74	26	78	—	—	—	18	—	4.03	—	—	—	—	—	—	—	—	—	—	—		
June	—	—	—	—	—	83	90	77	13	94	73	21	81	—	—	—	23	—	3.30	—	—	—	—	—	—	—	—	—	—	—		
July	—	—	—	—	—	82	88	76	12	95	73	22	82	—	—	—	24	—	2.98	—	—	—	—	—	—	—	—	—	—	—		
August	—	—	—	—	—	82	88	76	12	93	72	21	83	—	—	—	25	—	2.05	—	—	—	—	—	—	—	—	—	—	—		
September	—	—	—	—	—	81	87	75	12	93	73	20	85	—	—	—	26	—	3.85	—	—	—	—	—	—	—	—	—	—	—		
October	—	—	—	—	—	81	87	75	12	92	70	22	85	—	—	—	23	—	3.46	—	—	—	—	—	—	—	—	—	—	—		
November	—	—	—	—	—	80	86	73	13	90	66	24	82	—	—	—	14	—	1.96	—	—	—	—	—	—	—	—	—	—	—		
December	—	—	—	—	—	78	86	71	15	90	62	23	78	—	—	—	7	—	1.82	—	—	—	—	—	—	—	—	—	—	—		
Means	—	—	—	—	—	82	89	75	14	—	—	—	79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Absolute Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of Yrs. Obsn.	11	—	—	—	—	16	—	10	3	—	—	—	10	6	23	10	5	—	—	—	—	—	—	—	—	—	—	—	—	—		

\*Correction for Gravity = -0.07 in. Not applied.

Authorities:—"Annales du Bureau Central Météorologique de France,"  
 "Challenger" Report.

Meteorological Office,  
 January, 1912.

PLACE—HANOI. OBS.  $\Delta$  LAT.  $21^{\circ} 2' N.$ , LONG.  $105^{\circ} 48' E.$  Height above M.S.L. 53 feet.  
METEOROLOGICAL TABLE COMPILED FROM 6 TO 13 YEARS' OBSERVATIONS.

MONTH.	BAROMETER * At 33° F. and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity. Scale 0 to 10.		RAIN.		Mean Force Beaufort Scale.	WIND.								No. of Days Gale.	No. of Days Fog.	
	For Month.	Daily Range.	Mean.	Range.	Mean.		Absolute.		Total Fall.	No. of Days.	Max. Fall in 24 hours.	Number of Days from														
					Max.	Min.	Range.	Max.				Min.	Range.	N.		N.E.	S.	S.W.	W.	N.W.	Calm.					
January	Ins. 30-15	Ins.	Ins.	Ins.	° 64	° 71	° 57	° 14	° 50	° 50	7	Ins. 0-54	5	Ins. 0-64	3	6	7	6	8	3	0	0	1	0	—	—
February	— 30-13	—	—	—	° 63	° 69	° 57	° 12	° 43	° 52	7	0-94	8	0-86	3	6	9	4	5	1	0	0	2	1	—	—
March	— 30-00	—	—	—	° 68	° 73	° 62	° 11	° 51	° 50	8	2-21	13	1-86	3	4	7	7	9	2	0	0	1	1	—	—
April	— 29-93	—	—	—	° 75	° 82	° 69	° 13	° 80	° 83	8	3-23	11	3-58	3	2	5	6	12	4	0	0	1	0	—	—
May	— 29-79	—	—	—	° 82	° 89	° 75	° 14	° 64	° 37	6	5-60	13	2-29	3	3	5	6	10	4	1	0	1	1	—	—
June	— 29-67	—	—	—	° 85	° 91	° 78	° 13	° 71	° 33	7	8-28	13	3-27	3	4	4	6	8	3	2	0	2	1	—	—
July	— 29-60	—	—	—	° 83	° 89	° 77	° 12	° 99	° 32	6	15-11	16	22-40	3	2	4	8	10	3	2	0	1	1	—	—
August	— 29-65	—	—	—	° 83	° 89	° 77	° 12	° 99	° 30	7	14-02	17	5-12	3	6	6	6	7	1	1	1	3	0	—	—
September	— 29-85	—	—	—	° 81	° 87	° 76	° 11	° 97	° 31	6	9-65	13	7-07	3	5	7	5	7	2	1	0	2	1	—	—
October	— 30-01	—	—	—	° 78	° 84	° 72	° 12	° 95	° 33	5	5-44	9	6-99	3	8	8	5	5	1	0	0	2	2	—	—
November	— 30-11	—	—	—	° 70	° 77	° 63	° 14	° 50	° 41	4	1-12	4	1-12	3	6	12	3	5	1	0	0	2	1	—	—
December	— 30-12	—	—	—	° 67	° 74	° 60	° 14	° 46	° 42	5	0-88	5	1-80	3	6	10	5	6	1	1	0	1	1	—	—
Means	— 29-92	—	—	—	° 75	° 81	° 69	° 12	—	—	6	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	67.02	127	—	—	—	58	84	92	26	8	1	19	10	—	—
Absolute Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Yrs. Obs.	13	—	—	—	—	—	—	—	—	—	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

\*Correction for Gravity = -0.06 in. Not applied.

Authority:—"Annales du Bureau Central Météorologique de France."

Meteorological Office,  
January, 1912.

PLACE—MACAO. OBS. Δ LAT. 22° 11' N., LONG. 113° 32' E. Height above M.S.L., 26 feet.  
METEOROLOGICAL TABLE COMPILED FROM 15 YEARS' OBSERVATIONS. (1870-1884.)

# APPENDIX.

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MONTH.	BAROMETER.* At 32° F. and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity.		RAIN.			WIND.								No. of Days Gale.	No. of Days Fog.
	Mean.		Absolute.		Mean.			Absolute.			Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force Beaufort Scale.	Number of Days from										
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.					Range.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	
January	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	Ins.	—	7	4	8	6	1	0	0	4	1	—		
February	30-20	—	—	—	—	61	°	°	°	°	°	—	—	11	3	4	3	1	0	0	5	1	—		
March	30-15	—	—	—	—	61	—	—	—	—	—	—	—	6	3	7	9	2	1	0	2	1	—		
April	30-10	—	—	—	—	65	—	—	—	—	—	—	—	3	2	6	10	5	2	0	1	1	—		
May	29-09	—	—	—	—	73	—	—	—	—	—	—	—	1	1	7	7	6	6	2	1	0	—		
June	29-07	—	—	—	—	81	—	—	—	—	—	—	—	0	1	5	8	10	4	2	0	0	—		
July	29-08	—	—	—	—	85	—	—	—	—	—	—	—	1	2	7	5	6	8	1	1	0	—		
August	29-74	—	—	—	—	85	—	—	—	—	—	—	—	1	1	7	4	3	10	3	2	0	—		
September	29-76	—	—	—	—	85	—	—	—	—	—	—	—	2	4	11	5	2	3	1	2	0	—		
October	29-86	—	—	—	—	84	—	—	—	—	—	—	—	2	5	12	9	2	0	1	0	0	—		
November	30-00	—	—	—	—	81	—	—	—	—	—	—	—	14	9	4	1	0	0	0	2	0	—		
December	30-12	—	—	—	—	70	—	—	—	—	—	—	—	13	6	5	2	1	0	0	3	1	—		
December	30-19	—	—	—	—	64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Means	29-08	—	—	—	—	75	—	—	—	—	—	—	—	61	41	83	69	39	34	10	23	5	—		
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Absolute Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
No. of Yrs. Obsn.	15	—	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
1 (1882)																									

\*Correction for Gravity = -0.06 in. Not applied.

Authority:—"Challenger" Report.

Meteorological Office,  
January, 1912.



PLACE—CANTON. OBS. Δ LAT. 23° 12' N., LONG. 113° 17' E. Height above M.S.L., 100 feet.  
METEOROLOGICAL TABLE COMPILED FROM 10 TO 16 YEARS' OBSERVATIONS.

MONTH.	BAROMETRICAL. At 89° F. and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity. Scale 0 to 10.	RAIN.		WIND.								No. of Days Gale.	No. of Days Fog.	
	Mean.		Absolute.		Mean.		Absolute.		No. of Days.	Total Fall.		Max. Fall in 24 hours.	Mean Force Beaufort Scale.	Number of Days from										
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.						N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
January	Ins. 30-29	Ins.	Ins.	59	67	54	13	83	37	46	Ins. 1-43	7	Ins.	2	17	—	4	—	1	—	2	7	2-7	—
February	—	—	—	58	62	53	9	84	35	49	3-47	13	—	2	16	—	3	—	1	—	1	7	—	3-5
March	—	—	—	64	67	59	8	86	42	44	7-03	15	—	2	12	—	9	—	1	—	1	8	—	1-6
April	—	—	—	72	77	68	9	92	45	47	8-29	15	—	2	5	—	16	—	2	—	0	7	—	0-9
May	—	—	—	79	84	75	9	94	62	32	10-04	18	—	2	2	—	17	—	3	—	0	9	—	0-0
June	—	—	—	83	86	79	7	97	64	33	9-02	17	—	2	1	—	17	—	5	—	0	7	—	0-0
July	—	—	—	83	87	80	7	101	71	30	11-00	16	—	2	0	—	18	—	4	—	1	8	—	0-0
August	—	—	—	84	89	80	9	99	69	30	9-74	15	—	2	2	—	14	—	5	—	1	9	—	0-0
September	—	—	—	82	86	78	10	97	63	34	5-07	10	—	2	8	—	9	—	3	—	1	9	—	0-0
October	—	—	—	77	83	73	10	94	56	38	3-46	5	—	2	14	—	8	—	1	—	1	7	—	0-3
November	—	—	—	68	75	64	11	87	48	39	1-05	5	—	2	19	—	3	—	0	—	1	7	—	0-4
December	—	—	—	61	69	57	12	84	41	43	1-06	4	—	2	19	—	3	—	1	—	1	7	—	1-5
Means	—	—	—	73	78	68	10	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	73-06	140	—	—	115	—	121	—	27	—	10	92	—	10-9
Absolute Values	—	—	—	—	—	—	—	101	35	64	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Yrs. Obsn.	10	—	—	16	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	—	10

\*Correction for Gravity = -0.05 in. Not applied.

Authorities:—Medical Reports to the Imperial Maritime Customs, China.  
"Challenger" Report.

Meteorological Office,  
January, 1912.

MONTH.	BAROMETER * At 32° F. and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity. Scale 0 to 10.		RAIN.		WIND.										Max. Force Beaufort Scale.	No. of Days Force.							
	Mean.		Absolute.		Mean.		Absolute.		For Month.	Range.	Total Fall.	No. of Days.	Max. Fall in 24 hours.	Number of Days from																			
	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	N.E.						E.	S.E.	S.	S.W.	W.	N.W.	Calm.													
January	Ins. - 30-17	Ins. 0-11	Ins. 30-62	Ins. 29-80	Ins. 0-82	61	°	65	57	8	°	79	32	47	74	%	6	0-98	7	Ins	3-92	4	3	7	15	0	0	0	2	2	2	8	3
February	- 30-15	0-11	30-51	29-53	0-98	59	°	82	55	7	°	79	38	41	76	8	1-45	9	2-19	9	2-19	4	3	6	15	1	0	0	0	1	2	9	4
March	- 30-06	0-11	30-42	29-66	0-76	64	°	87	60	7	°	82	46	36	84	9	2-82	11	3-58	11	3-58	4	1	5	18	2	0	1	1	1	2	9	8
April	- 29-95	0-09	30-27	29-69	0-58	72	°	75	68	7	°	89	56	33	85	8	4-92	13	5-21	13	5-21	4	0	4	16	3	1	2	1	1	2	8	6
May	- 29-85	0-09	30-16	29-55	0-61	78	°	82	74	8	°	92	64	28	84	8	12-40	16	20-50	16	20-50	4	0	3	14	3	3	5	2	0	1	8	2
June	- 29-76	0-07	29-99	29-39	0-60	81	°	85	77	8	°	94	69	25	83	8	15-98	21	12-63	21	12-63	4	0	2	8	4	4	8	2	0	2	9	1
July	- 29-74	0-07	30-00	28-87	1-13	83	°	87	78	9	°	94	72	22	83	7	14-92	21	13-48	21	13-48	3	0	1	8	5	4	6	4	1	2	12	1
August	- 29-74	0-07	29-96	29-20	0-76	82	°	86	78	8	°	97	72	25	83	7	14-79	17	8-06	17	8-06	3	0	2	8	3	3	6	4	1	4	12	4
September	- 29-84	0-08	30-12	28-90	1-13	81	°	86	77	9	°	94	66	28	77	6	11-67	13	5-86	13	5-86	3	2	4	13	2	1	3	2	1	2	12	3
October	- 29-99	0-09	30-30	29-20	1-10	77	°	81	73	8	°	94	57	37	71	5	5-22	8	10-19	8	10-19	4	4	7	15	1	0	0	1	1	2	12	1
November	- 30-10	0-10	30-42	28-85	1-57	70	°	75	65	10	°	86	47	39	65	5	1-46	5	5-88	5	5-88	4	5	7	14	0	0	0	1	1	2	12	1
December	- 30-17	0-11	30-55	29-87	0-68	65	°	68	59	9	°	82	41	41	65	5	0-97	5	1-67	5	1-67	4	5	7	14	1	0	0	1	1	2	10	3
Means	- 29-96	0-09	-	-	-	73	°	77	69	8	°	-	-	-	78	7	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Totals	-	-	-	-	-	-	°	-	-	-	°	-	-	-	-	-	87-48	146	-	-	-	-	23	55	158	25	16	31	21	11	25	-	37
Absolute Values	-	-	30-62	28-85	1-77	-	°	97	32	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. of Yrs. Obsns.	44	20	20										49	20										20	25								20

\*Correction for Gravity = -0.06 in. Not applied.

Authority :—"Observations made at the Hong Kong Observatory."

Meteorological Office,  
January, 1912.

## APPENDIX V.

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LIST OF SPOTS SUITABLE FOR MAGNETIC OBSERVATIONS AND  
LIST OF PLACES WHERE ABNORMAL VARIATIONS HAVE  
BEEN OBSERVED EMBRACED BY THIS VOLUME.

---

*Place suitable for Observations:*

Hong Kong Magnetic Observatory ...	} Lat. $22^{\circ} 18' 12''$ N., Long. $114^{\circ} 10' 28''$ E.

---

*Places where Abnormal Variations have been Observed:*

Nil.

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Pacific cable route.—Report on sounding cruise of H.M.S. "Egeria"	0	9
Report on the results of dredgings obtained on the Macclesfield bank in 1888, 1892, and 1893	2	0
Oceanic depths.—Observations received during 1894-1895	(each)	2 0
" " " " " 1897	-	5 6
" " " " " 1898	-	4 0
" " " " " 1899	-	2 6
" " " " " 1900	-	4 0
" " " " " 1901	-	5 6
" " " " " 1903	-	2 6
" " " " " 1904-1905	(each)	2 0
" " " " " 1906, 1907, 1908, 1909	(each)	1 0
" " " " " 1910	-	2 0

**MISCELLANEOUS.**

Catalogue of charts, plans and sailing directions ( <i>corrected annually to 31st December</i> ).		
Consecutive List of Admiralty Charts ( <i>corrected annually to 31st December</i> )	0	8
Admiralty manual of scientific enquiry, 5th edition, 1886	2	6
Distance tables, North and West Coasts of Europe, from White sea to the Strait of Gibraltar, including the British islands, Iceland, Færoes, and the Baltic	1	6
Distance tables, Mediterranean, Black, and Red seas	1	6
Rules for finding distances and heights at sea, 5th edition, 1866	0	6
Dock book containing dimensions of the wet and dry docks, patent slips, &c., of the world, with information relating to shipbuilding and engineering works, 1905	10	0
Supplement, 1908	1	0
On the Station-pointer, and the manner of fixing a ship's position by its aid, 1903	0	6
Notes bearing on the navigation of H.M. ships, 1909	0	2
General instructions for Hydrographic Surveyors, 1909	2	6
Report on the positions of the outer light-vessels of the Thames estuary, 1905	0	1
Report on the determination of the difference of longitude, Greenwich—Ascension—Cape	1	0
A new method of clearing the lunar distance, 1881	0	3
Index of 800 stars to the 4.5 magnitude, 1895	6	0
Index to Notice to Mariners, 1911	1	0

## ADMIRALTY AGENT FOR THE SALE OF CHARTS.

LONDON - - - J. D. Potter - - - 145, Minories, E.C.

. SUB-AGENTS. (*In the United Kingdom.*)

BARRY	-	-	T. L. Ainsley	-	-	1, Tip.
"	-	-	Hayes Bros.	-	-	Station Road.
BELFAST	-	-	S. D. Neill	-	-	22, Donegal Place.
BLYTH	-	-	Alder & Co.	-	-	Ridley Street.
BRISTOL	-	-	Price & Moore	-	-	1 and 2, Broad Quay.
CARDIFF	-	-	T. J. Williams	-	-	63, Bute Street, Docks.
"	-	-	T. L. Ainsley	-	-	Primavesi Chambers, James Street.
"	-	-	Wilson & Gillie, Bruce & Son	-	-	91, Bute Street.
COWES (WEST)	-	-	G. H. May & Co.	-	-	126 & 127, High Street.
"	-	-	Pascall, Atkey & Son	-	-	29, High Street.
DARTMOUTH	-	-	Cranford & Son	-	-	Library, Fairfax Place.
DOVER	-	-	C. Clout	-	-	135, Snargate Street.
DUBLIN	-	-	Hodges, Figgis, & Co., Ltd.	-	-	104, Grafton Street.
FALMOUTH	-	-	Williams & Co.	-	-	The Quay.
GLASGOW	-	-	Whyte, Thomson & Co.	-	-	96, Hope Street.
"	-	-	Dobbie, McInnes, Ltd.	-	-	57, Bothwell Street.
"	-	-	D. McGregor & Co.	-	-	57, Bothwell Street.
"	-	-	Kelvin & James White, Ltd.	-	-	16-18, Cambridge Street.
GOSPORT	-	-	Camper & Nicholsons	-	-	Yacht Builders.
GREENOCK	-	-	Glendinning & Co.	-	-	33, Cathcart Street.
GRIMSBY	-	-	H. A. Johannesen	-	-	Fish Dock Road.
HARWICH	-	-	John Groom & Sons	-	-	Lloyd's Agents.
HULL	-	-	Newton Bros. & Holiday	-	-	Prince's Dock.
"	-	-	W. Hakes	-	-	Commercial Road.
KINGSTOWN (CO. DUBLIN)	-	-	R. Perry & Co., Ltd.	-	-	114, Lower George's Street.
LEITH	-	-	D. Stalker	-	-	6 & 8, Commercial Street.
LIVERPOOL	-	-	Philip, Son & Nephew	-	-	49 & 51, South Castle Street.
"	-	-	John Parkes & Son	-	-	11, St. George's Crescent.
"	-	-	Frodsham & Keen	-	-	31, South Castle Street.
"	-	-	John Bruce & Sons	-	-	25, South Castle Street.
"	-	-	Dobbie, McInnes, Ltd.	-	-	39, South Castle Street.
LONDON	-	-	E. Stanford	-	-	12-14, Long Acre, W.C.
"	-	-	Imray, Laurie, Norie, & Wilson	-	-	156, Minories, E.C.
"	-	-	H. Hughes & Son	-	-	59, Fenchurch Street, E.C.
"	-	-	Sifton, Praed & Co., Ltd.	-	-	67, St. James' Street, S.W.
LONDONDERY	-	-	E. A. Minniece	-	-	23, Ship Quay Street.
MARYPORT	-	-	Quintin Moore	-	-	Harbour House.
MIDDLESBROUGH	-	-	Constantine, Pickering & Co.	-	-	Docks.
"	-	-	J. Durkin	-	-	Dock Street.
MILFORD HAVEN	-	-	W. H. Cowley	-	-	27, Hamilton Terrace.
NEWCASTLE-ON-TYNE	-	-	M. S. Dodds	-	-	61, Quayside.
"	-	-	S. A. Cail & Sons	-	-	29 & 31, Quayside.
NEWPORT, MON.	-	-	E. E. Williams	-	-	94, Dock Street.
NORTH SHIELDS	-	-	Wilson & Gillie	-	-	New Quay.
OBAN	-	-	Hugh Macdonald	-	-	"Times" Office, Esplanade.
PLYMOUTH	-	-	J. Blowey	-	-	23, Southside Street.
PORTSEA	-	-	Griffin & Co.	-	-	2, The Hard.
PORTSMOUTH	-	-	C. Groom, Ltd.	-	-	50, Broad Street.
QUEENSTOWN	-	-	T. Miller	-	-	1, Harbour Row.
SOUTH SHIELDS	-	-	T. L. Ainsley	-	-	Mill Dam.

SOUTHAMPTON	-	F. Smith & Son	-	-	23, Oxford Street.
"	-	Frank Moore, Ltd.	-	-	90, High Street.
SUNDERLAND	-	J. J. Wilson & Son	-	-	18 & 19, Hudson Road.
"	-	T. Reed & Co.	-	-	184, High Street West.
WEST HARTLEPOOL	-	A. Willings & Co.	-	-	73, Church Street.

SUB-AGENTS. (*Abroad.*)

ADELAIDE (S.A.)	-	A. E. Sawtell	-	-	Divett Street, Port Adelaide.
AMSTERDAM	-	L. J. Harri	-	-	Prins Hendrikade, No. 90.
ANTWERP	-	Bayne & Smith	-	-	54, Canal des Brasseurs.
ATHENS	-	Eleftheroudakis & Barth	-	-	Place de la Constitution.
BERLIN	-	D. Reimer	-	-	29, Wilhelmstrasse.
BOMBAY	-	Lawrence & Mayo	-	-	Esplanade.
BREMEN	-	W. Ludolph	-	-	6, Tannenstrasse.
BREMERHAVEN	-	W. Ludolph	-	-	72, Smidtstrasse.
BRISBANE (QUEENSLAND)	-	Watson, Ferguson & Co.	-	-	Queen Street.
CALCUTTA	-	Jas. Murray & Co.	-	-	Government Place.
CAPE TOWN	-	W. Mercer & Co.	-	-	9, Loop Street.
CONSTANTINOPLE (GALATA)	-	Blair, Campbell & Co.	-	-	Oriental Bazaar, Custom House Street.
GIBRALTAR	-	James Molinary	-	-	Shipchandler, &c.
HAGUE, THE	-	Van Cleef Brothers	-	-	Libraries.
HAMBURG	-	Eckhardt & Messtorff	-	-	Steinhof I.
"	-	Thos. Downie	-	-	9, Stubbenhuk.
"	-	Friederichsen & Co.	-	-	22, Monckeberg-strasse.
HAVRE	-	L. Croix	-	-	15, Rue de Paris.
HOBART (TASMANIA)	-	Walch & Sons	-	-	Merchants.
HONG KONG	-	C. J. Gaupp & Co.	-	-	Alexandria Buildings.
"	-	G. Falconer & Co.	-	-	Queen's Road, Central.
LOUBENÇO MARQUES	-	A. W. Bayley & Co.	-	-	Booksellers, &c.
MALTA	-	Collector of Customs	-	-	Custom House.
MARSEILLE	-	G. Viallet	-	-	8, Rue Beaveau.
MELBOURNE	-	J. Donne & Son	-	-	300, Post Office Place.
MONTREAL	-	Harrison & Co.	-	-	53, Metcalfe Street.
NEW YORK	-	John Bliss & Co.	-	-	128, Front Street.
NEWCASTLE (N.S.W.)	-	W. H. Sproull & Co.	-	-	99, Hunter Street.
PARIS	-	Augustin Challamel	-	-	17, Rue Jacob.
PEIRÆUS	-	H. C. Decavalla	-	-	Shipchandler.
PORT NATAL	-	Lewis J. Wilson	-	-	The Point.
PORT SAID	-	C. J. Vella & Co.	-	-	Shipping Agents.
QUEBEC	-	T. J. Moore & Co.	-	-	118 & 120, Mountain Hill.
RANGOON	-	Lawrence & Mayo	-	-	8, Phayre Street.
RIO DE JANEIRO	-	D. Norris	-	-	28, Rua da Assembleia.
SAINT JOHN (N.B.)	-	A. B. Smalley & Son	-	-	91, Prince William Street.
SAINT JOHN'S (NEW- FOUNDLAND)	-	Ayre & Son	-	-	231, Water Street.
SEATTLE (WASH.)	-	Max Kuner	-	-	94, Columbia Street.
SHANGHAI	-	Walter Dunn	-	-	29, Kiangsue Road.
"	-	Hirsbrunner & Co.	-	-	1, Nankin Road.
SINGAPORE	-	Hon. Sec. and Treasurer	-	-	Sailors' Home.
SYDNEY (N.S.W.)	-	Turner & Henderson	-	-	16 & 18, Hunter Street.
TOKYO (JAPAN)	-	Takata & Co.	-	-	Merchants.
TORONTO (CANADA)	-	Charles Potter	-	-	85, Yonge Street.
TRIESTE	-	F. H. Schimpff	-	-	11, Piazza della Borsa.
VANCOUVER CITY (B.C.)	-	Thomson Stationery Co., Ltd.	-	-	325, Hastings Street.
VICTORIA (B.C.)	-	Hibben & Co.	-	-	66, Government Street.

# CAUTION WHEN APPROACHING BRITISH PORTS.

(To be inserted inside cover of all Sailing Directions)

## PART I.—CLOSING OF PORTS.

(1) My Lords Commissioners of the Admiralty having taken into consideration the fact that it may be necessary to forbid all entrance to certain ports of the Empire, this is to give Notice that on approaching the shores of the United Kingdom, or any port of the British Empire, a sharp lookout should be kept for the signals described in the following paragraph, and for the vessels mentioned in paragraph (4), Part II., of this Notice, and the distinguishing and other signals made by them. In the event of such signals being displayed, the port should be approached with great caution, as it may be apprehended that obstructions may exist.

(2) If entrance to a port is prohibited, three *red* vertical lights by night, or three *red* vertical balls by day, will be exhibited in some conspicuous position in or near to its approach, which signals will also be shown by the vessels indicated in paragraph (4), Part II., of this Notice.

If these signals are displayed, vessels must either proceed to the position marked "Examination Anchorage" on the Admiralty Charts and anchor there, or keep the sea.

## PART II.—EXAMINATION SERVICE.

(3) Under certain circumstances, it may become necessary to take special measures to examine vessels desiring to enter the ports or localities at home or abroad, referred to in Notices to Mariners No. 1 of 1915 and subsequent years.

(4) In such case, vessels carrying the distinguishing flags or lights mentioned in paragraph (6) will be charged with the duty of examining ships which desire to enter the ports and of allotting positions in which they shall anchor. If Government vessels, or vessels belonging to the local port authority, are found patrolling in the offing, merchant vessels are advised to communicate with such vessels with a view to obtaining information as to the course on which they should approach the Examination Anchorage. Such communication will not be necessary in cases where the pilot on board has already received this information from the local authorities.

(5) As the institution of the Examination Service at any port will never be publicly advertised, especial care should be taken in approaching the ports, by day or night, to keep a sharp lookout for any vessel carrying the flags or lights mentioned in paragraph (6), and to be ready to "bring to" at once when hailed by her or warned by the firing of a gun or sound rocket.

In entering by night serious delay and risk will be avoided if four efficient all round lamps, two *red* and two *white*, are kept available for use.

(6) By day the distinguishing flags of the Examination Steamer will be a special flag (white and red horizontal surrounded by a blue border) and a blue ensign.

Also, three *red* vertical balls if the port is closed.

By night the steamer will carry: (a) Three *red* vertical lights if the port is closed; (b) three *white* vertical lights if the port is open.

The above lights will be carried in addition to the ordinary navigation lights, and will show an unbroken light around the horizon.

(7) Masters are warned that, before attempting to enter any of these ports when the Examination Service is in force, they must in their own interests strictly obey all instructions as to entry given to them by the Examination Steamer. In the absence of any instructions from the Examination Steamer they must proceed to the position marked "Examination Anchorage" on the Admiralty Charts, and anchor there, or keep the sea.

Whilst at anchor in the Examination Anchorage, Masters are warned that they must not lower any boats (except to avoid accident), communicate with the shore, work cables, move the ship, or permit anyone to leave the ship, without permission from the Examination Steamer.

(8) In case of fog, Masters of vessels are enjoined to use the utmost care, and the Examination Anchorage itself should be approached with caution.

(9) Merchant vessels when approaching British Ports are specially cautioned against making use of private signals of any description, either by day or night: the use of them will render a vessel liable to be fired on.

(10) The pilots attached to the ports will be acquainted with the regulations to be followed.

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